5

Alternatives

5. ALTERNATIVES

5.1 Opposition to the Proposed Action

5.1 (27)
Comment - 606 comments summarized
Commenters expressed broad opposition to the Proposed Action to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain. While many commenters did not identify specific deficiencies or problems with the Proposed Action and only stated their opposition to the proposal, other commenters expressed opposition to the Proposed Action by stating their support for the No-Action Alternative and the desire that the Nation discontinue development of the proposed Yucca Mountain Repository. A number of the commenters who expressed opposition to the repository through support of the No-Action Alternative did so because the Proposed Action would require transportation of spent nuclear fuel and high-level radioactive waste across the Nation. Specific issues cited included concerns for health and safety or economic impacts within the State of Nevada; treatment of Nevada as a "dumping ground" for the rest of the country; unfair influence of the nuclear power industry over the choice of Nevada for the repository location; safety for future generations; and concerns over specific repository performance issues, including the threat of earthquakes and groundwater contamination, and potential transportation problems. Many commenters cited more than one issue in their Comments.

Commenters citing specific repository performance issues provided Comments addressing several areas. Some commenters cited the potential for seismic activity. The site is on an active earthquake fault line in the Ghost Dance fault, earthquakes have been felt recently in Las Vegas, and Nye County is too unstable geologically to support a major nuclear waste repository. Some commenters cited the possible threat of volcanic activity. Commenters also stated that some studies have shown that the water table could rise into the repository in the future.

Other commenters expressed concerns over repository performance stated that the site is unsuitable because water seepage would cause nuclear waste to leak from the casks into groundwater and threaten water supplies, the repository could contaminate the groundwater in Amargosa Valley and Death Valley National Park, and the water supply for Las Vegas could be threatened. Some commenters stated that transportation accidents would be likely to happen and that transport across the country of hundreds of "Mobile Chernobyls" would be a severe health and safety threat. Others cited concerns over the possibility of developing cancer from exposures due to operations at the repository or from waste transportation operations to the repository. A few commenters stated that accumulating all of the Nation's nuclear waste in one place is "beyond engineering common sense." Others felt that such a concentration of waste would invite a terrorist attack.

Response
DOE acknowledges the commenters' opposition to the Proposed Action, its location in Nevada, and the range of concerns expressed about the safety and wisdom of transportation and repository operational plans. Because of the large number of comments received opposing the repository in general and/or for a range of specific reasons, DOE refers the commenters who have submitted comments summarized here to the discussion of issues in the introduction to this Comment-Response Document ("An Overview of Key Issues Raised in Comments") and to other comments and responses related to specific topics that cover the range of topics summarized here (see the Comment-Response Document Table of Contents).

5.1 (2005)
Comment - EIS000528 / 0002
I have known that the U.S. Government has been pursuing this venture for at least twenty years and I feel that the money spent could have been used to develop the plant, that was spoken of at the meeting, to neutralize the waste, but instead it appears that millions of dollars are being spent for salaries that do nothing for the nation but it appears to provide jobs and job security for a few. This I resent since it is our tax dollars that are being spent to ram this unacceptable storage incentive down the throats of a state that has limited input into the ultimate decision because of limited population and representation in government.

Response
DOE acknowledges the commenter's concern about funding of the Yucca Mountain Site Characterization Project. The commenter alludes to the fact that money could have been used to develop a waste neutralization facility. A National Academy of Sciences report to the Atomic Energy Commission (a DOE predecessor agency) in 1957 recommended burying radioactive waste in geologic formations (DIRS 100011-NAS 1957). In 1976, the Energy Research and Development Administration (another predecessor agency) began investigating geologic formations and different disposal concepts, including deep-seabed disposal, disposal in the polar ice sheet, and rocketing waste into the sun. In the *Final Environmental Impact Statement, Management of Commercially Generated Radioactive Waste* (DIRS 104832-DOE 1980), DOE evaluated alternatives to geologic disposal including very deep borehole disposal, disposal in a mined cavity that resulted from rock melting, island-based geologic disposal, subseabed disposal, ice sheet disposal, well injection disposal, transmutation, space disposal, and no action. In 1979, a report was submitted to the President recommending the design of a repository in which the natural and engineered barriers work as a system, so no barriers would fail for the same reason or at the same time. This design strategy is known as "defense in depth" (DIRS 100149-Interagency Review Group on Nuclear Waste Management 1979). In a 1981 Record of Decision (46 *FR* 26677), DOE decided to pursue the mined geologic disposal alternative for the disposition of spent nuclear fuel and high-level radioactive waste.

Congress was aware of previous studies when it decided to pursue geologic disposal and enacted the Nuclear Waste Policy Act, which established the Federal Government's responsibility to provide permanent disposal of the Nation's spent nuclear fuel and high-level radioactive waste. Through the passage of the Nuclear Waste Policy Amendments Act of 1987, Congress amended the law, selecting only Yucca Mountain as a potential location for a geologic repository and directing DOE to determine whether Yucca Mountain would be suitable for a geologic repository.

DOE has an ongoing program of investigations and evaluations to assess the suitability of the Yucca Mountain site as a potential geologic repository and to provide information for the EIS. The program consists of scientific, engineering, and technical studies and activities. DOE has used information from this site characterization program, along with population data from the 2000 National Census, to prepare the EIS. Although the NWPA directs that DOE prepare an EIS to evaluate the potential environmental impacts associated with development of a geologic repository, the EIS is not required to consider the need for a geologic repository, the time at which a repository could become available, or alternatives to isolating spent nuclear fuel and high-level radioactive waste. In addition, the EIS does not have to consider any site other than Yucca Mountain for development of a repository. Under the Act, the EIS is one of many documents the Secretary of Energy will use in deciding whether to recommend Yucca Mountain to the President for development of a repository.

The ultimate decision on whether Yucca Mountain is developed and placed into operation lies with the President, the United States Congress, and the State of Nevada. As part of the process, Section 114 of the NWPA specifies that the State of Nevada has an opportunity to provide input to the Site Recommendation process for a repository. In addition, the State of Nevada can, if it so elects, file a notice of disapproval, which would require an Act of Congress to override. Sections 115 and 116 of the Act provide a description of the role and participation of states in the decisionmaking process for a repository.

5.1 (2953)
Comment - EIS000727 / 0001
The local chapter of the Sierra Club opposes the proposed Yucca Mountain Project for the following reasons. Our reasons fall into five areas of concern: site safety, alternatives considered, risk assessment, transportation issues, and issues with environmental justice and public participation.

Response
In preparing the EIS, the Department used the best currently available information to analyze potential environmental impacts and performed analyses in a conservative manner that tended to overestimate the impacts that could occur from the construction, operation and monitoring, and closure of the repository. DOE specifically evaluated a full range of issues in the EIS including health and safety, transportation, and environmental justice. Many of the analyses performed were based on risk assessments and the probabilities of certain events occurring.

In relation to public participation, DOE conducted the EIS process consistent with National Environmental Policy Act implementing procedures (10 CFR Part 1021). The process, as demonstrated by this Comment-Response Document, subjected EIS development to public scrutiny. As discussed in Section 1.5.1 of the EIS, public scoping meetings, public hearings, and public review of the Draft EIS and Supplement to the Draft EIS by stakeholders, government agencies, Native American tribes, and members of the public comprised an important part of the process. Commenters had the opportunity to send written comments by regular or electronic mail, provide facsimile comments over a toll-free telephone line, or provide comments at 21 public hearings around the country on the Draft EIS and 3 public hearings in Nevada on the Supplement.

In relation to alternatives, DOE has been considering various technologies for the management of spent nuclear fuel for a number of years, including very deep hole disposal, disposal in a mined cavity, island-based geologic disposal, transmutation, and disposal in outer space. Various studies including those on accelerator transmutation of waste are still ongoing (see Section 9.1.3 of the EIS). However, under the NWPA, DOE is authorized to characterize and evaluate geologic disposal only at Yucca Mountain in the EIS.

Regarding environmental justice, the results of the analysis show that the Proposed Action would not result in significant environmental or health and safety impacts to any segment of the population. Using available information, DOE evaluated the likelihood that circumstances unique to minority and low-income populations could create a potential for these populations to be exposed to disproportionately high and adverse impacts.

Chapter 4 of the EIS discusses health and safety impacts from repository operations and Chapter 6 discusses the impacts from transportation of spent nuclear fuel and high-level radioactive waste.

5.1 (4335)
Comment - EIS001202 / 0004
I am unalterably opposed to HB 45 and S1287, the Yucca Mountain High Level Waste Bills. I feel that the nuclear waste issue needs more current and open debate about what to do with the dangerous residues.

The spokesperson Wendy Dixon, was competent in explaining the process of the DOE mission. But only the Congress can explain why we are pursuing a 1980's agenda of dump it all in Yucca Mountain, an earthquake prone area sacred to the Western Shoshone, opposed by 70% of Nevada's citizens and all of its Congressional members.

Response
President Clinton vetoed the final version of the bill mentioned in the comment. DOE is considering the Yucca Mountain site pursuant to explicit direction from Congress in the NWPA.

5.1 (5904)
Comment - EIS000815 / 0003
Creation of geologic deposits of large quantities of accessible, weapons usable material and denial of an important energy resource are not responsible actions. The Proposed Action for disposal of spent fuel at Yucca Mountain should not be approved.

The proposed repository would provide acceptable long-term isolation from the biosphere of high-level radioactive waste - i.e., unwanted fission products that remain after recovery of fissionable materials. The United States needs a repository for isolation of these wastes.

The planned action for disposal of high-level radioactive wastes at Yucca Mountain should be approved, and shipments of these materials from DOE's Savannah River, South Carolina, and West Valley, New York, sites should begin as soon as possible. (However, vitrified waste which would contain embedded [briquettes] of excess weapons plutonium are not appropriate for permanent disposal at Yucca Mountain. John Ahearne, a member of your "Presidents Committee of Advisors on Science and Technology" (PCAST) and the National Academy of Sciences committee considering plans for disposition of excess weapons plutonium discussed this material at the 1999 Winter Meeting of the American Nuclear Society. He explained that plutonium contained in vitrified waste in this manner would not provide protection equivalent to that for plutonium in spent fuel. This plutonium in a permanent repository would also be a permanent diversion/proliferation threat. The plan to embed excess weapons plutonium in vitrified waste as a means to dispose of this material should be canceled.)

The United States needs responsible programs for long term isolation of unwanted, intensely radioactive fission products in spent fuel, but indefinite storage of spent fuel at nuclear power plant sites or at Yucca Mountain in Nevada is not such a program. At least 99.8% of the plutonium and other fissionable materials, and any valuable fission products in spent fuel must be removed prior to transfer of the unwanted fission products to a permanent repository. Facilities where this is carried out must be designed and operated so that there is no accumulation of weapons materials except in hardened areas between process steps. Recovered weapons usable materials would be immediately fabricated into mixed oxide fuels and destroyed and/or rendered inaccessible by irradiation in nuclear power plants. This is discussed further in "Nuclear Technology: Need for New Vision," a paper presented at the Global Foundation International Energy Forum in Washington DC on November 5, 1999.

Response
Congress has determined through passage of the NWPA, that the Federal Government has the responsibility to dispose of spent nuclear fuel and high-level radioactive waste permanently to protect the public health and safety and the environment. To this end, the Act directs DOE to characterize and evaluate the Yucca Mountain site and make a recommendation to the President on whether to approve the site for development as a repository. In accordance with the Act, the Department is proceeding toward a site recommendation determination; completion of this EIS is an important part of the process.

Because the United States does not reprocess commercial spent nuclear fuel, separation and subsequent isolation of weapons-usable materials or valuable fission products has not occurred. Therefore, most of the candidate material for the repository consists of commercial and DOE spent nuclear fuel. However, because Congress recognized that new technologies for waste management could be developed in the future and that spent nuclear fuel contains potentially valuable resources, the NWPA requires retrievability at the repository for at least 50 years after the start of waste emplacement. In accordance with these requirements, the operational plan for the Yucca Mountain Repository provides for a design and management approach that isolates wastes from the public in the future while allowing flexibility to preserve options for modifying emplacement and retrieving the waste. This design would maintain the ability to retrieve emplaced materials for at least 100 years and possibly as long as 300 years in the event of a decision to retrieve the waste either to protect the public health and safety or the environment or to recover resources from spent nuclear fuel.

Regarding the possibility of removal of weapons-usable materials following closure of the repository, Congress developed the policy, defined in the NWPA, of deep geologic disposal for spent nuclear fuel and high-level radioactive waste with the intent of isolating the material from the accessible environment. DOE believes that placing the material 200 meters (660 feet) below the surface in a repository excavated from solid rock satisfies the intent of such isolation in relation to potential terrorist activity. To excavate to the repository level after closure would require a very large level of effort; it would require sophisticated excavation equipment, a large workforce, and a significant expenditure of funds—all unlikely to happen without being highly visible. For this reason, it is unlikely that such activity would ever take place. Even if terrorists were able to penetrate to repository depth, the spent nuclear fuel, immobilized plutonium, and high-level radioactive waste would be in waste packages weighing between 32 and 82 metric tons (35 and 90 tons) and made of solid metal. Without the ventilation systems and emplacement equipment that DOE would use to handle the waste packages remotely, terrorists would probably not survive the high temperatures and high radiation fields in the repository. Therefore, it is unlikely that terrorists could remove or significantly damage a waste package.

5.1 (7274)
Comment - EIS001957 / 0001
If the [Yucca Mountain] facility were built and operated as proposed, and never leaked into groundwater or elsewhere, it could be acceptable. Of course, if that were true, the facility could be built anywhere. A paramount concern underlying our Comments is that things that can go wrong sometimes do. Should something go awry at the top of the geologically active Yucca Mountain system, irreplaceable resources existing downstream will be affected. Thus, even if one accepts the as yet unproven premise that the possibility of leaks is small, the consequences of leakage would be catastrophic. And, unfortunately, such an incident is possible within decades, centuries, or even millennia of operational start-up.

Response
DOE acknowledges the National Park Service's opposition to the Proposed Action, its location at the Yucca Mountain site, and the range of concerns expressed over the safety of operational plans.

Other parts of this Comment-Response Document contain responses to comments related to specific resource areas, such as groundwater and seismic issues, or impact analyses addressing repository performance and nuclear material transportation. The decision to evaluate the use of a repository at Yucca Mountain is a national policy initiative embodied in the Nuclear Waste Policy Act, as amended. The Secretary of Energy will consider the results of the environmental analyses reported in this EIS, site suitability studies, and public input, as demonstrated in this Comment-response Document, in determining whether to recommend development of the Yucca Mountain site as a geologic repository.

5.1 (7289)
Comment - EIS001957 / 0003
Based on information available so far, the National Park Service must oppose the proposed action.

Response
DOE acknowledges the National Park Service's opposition to the Proposed Action, its location at the Yucca Mountain site, and the range of concerns expressed over the safety of operational plans.

Other parts of this Comment-Response Document contain responses to comments related to specific resource areas, such as groundwater and seismic issues, or impact analyses addressing repository performance and nuclear material transportation. The decision to evaluate the use of a repository at Yucca Mountain is a national policy initiative embodied in the Nuclear Waste Policy Act, as amended. The Secretary of Energy will consider the results of the environmental analyses reported in this EIS, site suitability studies, and public input, as demonstrated in this Comment-Response Document, in determining whether to recommend development of the Yucca Mountain site as a geologic repository.

5.1 (9133)
Comment - EIS001860 / 0003
Although an argument might be made that Yucca Mountain and its surroundings are already contaminated by proximity to the Nevada Test Site, it isn't sufficiently compelling when you consider the cultural resources which will be sacrificed, environmental justice considerations and the overwhelming failure of the plan to address transportation issues comprehensively or propose adequate monitoring of the site for the active life of nuclear waste. Subsidiary but essential issues are the need to reclassify radioactive wastes for storage and the impropriety of rushing to a premature solution to our nuclear waste disposal problems.

Response
Congress made the decision to focus on the Yucca Mountain site as a geologic repository through the passage of the Nuclear Waste Policy Amendments Act of 1987, directing the Secretary of Energy to perform site characterization activities at the Yucca Mountain site, and if the site was found suitable, to make a determination whether to recommend to the President the development of the site for a repository.

Land disturbances associated with the Proposed Action could have direct impacts on cultural resources around Yucca Mountain. Cultural resource documentation efforts at the repository site have been ongoing since 1982. None of the archaeological and historic sites identified in the immediate vicinity of the proposed surface facilities has been listed on the *National Register of Historic Places*, but 150 are potentially eligible. DOE would avoid such sites if possible or, if avoidance was not possible, would conduct a data recovery program in cooperation with tribal representatives and other appropriate officials and would document the findings.

The environmental justice methodology applies two tests in determining the potential for environmental justice impacts. The first test assesses the potential for impacts from the Proposed Action to affected populations to be high and adverse. The second test assesses the potential for high and adverse impacts to fall disproportionately on minority or low-income populations. Using these tests, impacts must be both adverse and high before there would be a potential for environmental justice impacts to occur. The EIS analyses determined that the impacts that could

occur to public health and safety would be small on the population as a whole for all phases of the Proposed Action, and that no minority or low-income populations would receive disproportionately high and adverse impacts.

DOE believes the EIS provides sufficient information on selection of transportation alternatives in the State of Nevada. Chapter 6 and Appendix J of the EIS discuss the transportation of spent nuclear fuel and high-level radioactive waste. It is premature at this time to analyze the hazards, vulnerabilities, and risks of specific routes and locations to identify preferred routes. The Department has acknowledged that additional investigations would be required for determining specific transportation alternatives.

A postclosure monitoring program is required by 10 CFR Part 63 as part of the Nuclear Regulatory Commission license, if the site is developed. DOE would submit a license amendment application that updated the assessment for the repository's performance for the period after permanent closure and described the postclosure monitoring program. This program would include continued oversight to prevent any activity at the site that posed an unreasonable risk of breaching the geologic repository's engineered barriers; or exposed individual members of the public to radiation that exceeded allowable limits. This program would be described at the time of closure to allow for the identification of emerging technology available in the future.

The concept of permanently disposing of nuclear waste in a deep geologic repository stems from studies initiated in the 1950s by the National Academy of Sciences. Continued studies in this country and abroad have concluded that deep geologic disposal isolates nuclear waste from the accessible environment in geologic formations known to have been stable for millions of years, thus providing a safe location for the waste to decay into a stable form. However, to allow a consideration of future technologies and resource recovery, Section 122 of the NWPA requires retrievability at a high-level radioactive waste repository. Federal regulations (10 CFR Parts 60 and 63) require that the repository be designed and operated to preserve the option of waste retrieval on a reasonable schedule for as long as 50 years after the start of waste emplacement. In accordance with these requirements, the operational plan for the proposed Yucca Mountain Repository provides for a design and management approach that isolates wastes from the public in the future while allowing flexibility to preserve options for modifying emplacement and retrieving waste. This design would maintain the ability to retrieve emplaced materials for at least 100 years and possibly as long as 300 years or more after the end of waste emplacement, if a decision was made to retrieve the waste either to protect the public health and safety and the environment or to recover resources from spent nuclear fuel. During this period, the repository would remain accessible for scientists to continue testing and monitoring while providing more flexibility for future generations who would ultimately determine the timing and methods of repository closure.

5.1 (10786)
Comment - EIS000273 / 0006
Georgia had an opportunity to get this repository in Georgia in 1986 when sites were identified by the Department of Energy in granite rock bodies in eastern states. But it was a political and not a technical decision by the Congress to target Yucca Mountain only for consideration for a repository. Now, we in Nevada might feel differently about all this if all the other sites had been appropriately evaluated the way the 1982 federal law said they would be. But then in 1986 all the eastern folks with all the electoral votes got very concerned about their backyards, and they decided to dump it in ours. And you need to understand that this whole debate since 1986 has been, unfortunately, in my opinion, unnecessarily adversarial because of the political decision. So it was political science and not earth science that chose Yucca Mountain as the candidate site.

Response
Thank you for your input. Sections 1.3.1 and 1.3.2 of the EIS discuss some of the background related to the management of spent nuclear fuel and high-level radioactive waste.

5.1 (11185)
Comment - EIS000252 / 0006
What's happening is the environmental justice piece of this is the politically weak states in the west that are not as populated are going to take the brunt of this particular radioactive waste that is going to Yucca Mountain and that is going all over the country, frankly.

So that is one of the aspects of environmental justice that I don't think is completely looked at within the EIS or within the Department of Energy's overall nuclear waste policy.

Frankly, it's just, like I said, without the Department of Energy taking a step back, and rethinking the entire nuclear waste policy, you are going to have these environmental justice problems because you are always going to have those folks that are out there wanting to do a quick and dirty political answer to a scientific problem. Yucca Mountain isn't the scientific answer to the problem for this high-level waste.

Don't dump it on the western states that are politically weak.

Response
DOE is evaluating the suitability of the Yucca Mountain site for a geologic repository because Congress has directed it to do so in the NWPA. This EIS does not analyze Congressional considerations that might have accompanied passage of the Act.

Environmental justice issues (see Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations") focus on the potential for proposed actions to have disproportionately high and adverse effects on minority and low-income populations. The analyses performed for the EIS found no such effects would occur. Further, these issues do not encompass political matters that might arise between states.

5.1 (11603)
Comment - EIS002237 / 0001
I want to make it very clear for the record that Nye County has always held a neutral position on Yucca Mountain; we neither favor nor oppose it because we are concerned about the health and safety of our citizens.

Response
DOE will continue to work with the appropriate representatives of Nye County to share information about potential health and safety issues associated with the operation of the proposed Yucca Mountain Repository.

5.1 (11667)
Comment - EIS002298 / 0001
WHEREAS, The people of the Western Shoshone Nation find the presence [of] radioactive materials, nuclear power facilities and nuclear weapons facilities within the lands, the watershed or airshed of the lands of the Western Shoshone Nation, known in the Shoshone language as Newe Sogobia, as set forth in the treaty of Ruby Valley of 1863, to be in conflict with the maintenance of the community's economic well-being, health, and general welfare; and,

WHEREAS, Nuclear weapons testing by the United States government on Western Shoshone lands, in direct conflict with Western Shoshone National Council law and policy, has left portions of Newe Sogobia scarred and permanently contaminated with radiation; and,

WHEREAS, The aforementioned nuclear weapons testing by the United States government on Western Shoshone lands has already caused widespread cancer, bringing illness and death to Western Shoshone, members of other Indian nations, and the non-Indian people of the Great Basins region; and,

WHEREAS, The United States government continues to contaminate Western Shoshone lands at the Nevada Test Site by importing and, dumping, radioactively and chemically contaminated soil and other waste products; and,

WHEREAS, The United States Geological Survey has found that the aquifer under the Beatty radioactive waste dump site is about to become contaminated with long-lived radionuclides, endangering drinking water on Western Shoshone lands; and,

WHEREAS, The government of the United States, against the expressed wishes of the Western Shoshone National Council, is proposing to store highly-irradiated fuel from commercial nuclear power plants, which will remain deadly for hundreds of thousands of years, at Yucca Mountain, within Western Shoshone lands; and,

WHEREAS, A high volume of truck transportation of radioactive wastes can be expected through the Western Shoshone Nation's lands and the surrounding region, increasing the likelihood of an accident and the rapid dispersal to the environment of deadly, long-lived radioactive wastes; and,

WHEREAS, The presence of radioactive waste dumps in the region, and the publicity surrounding it, will severely harm the economy of the Western Shoshone and neighboring peoples; and,

WHEREAS, Over 4,500 local communities throughout the world, 25 nations; and the regions of the Antarctic, Latin America and the South Pacific have been declared nuclear free zones; and,

WHEREAS, The National Council of the Western Shoshone encourages the development of clean, renewable energy resources in order to create jobs that maintain the traditional Native American values of care-taking and balance with natural creation; and,

WHEREAS, The National Council of the Western Shoshone encourages research into radioactive waste neutralization techniques and demands the stabilization and or clean up, if possible, of existing radioactive waste on the lands of the Western Shoshone Nation;

NOW, THEREFORE

SECTION 1. BE IT ORDAINED BY THE WESTERN SHOSHONE NATIONAL COUNCIL, That the following declaration be added to made a part of the laws of the Western Shoshone Nation:

NUCLEAR FREE ZONE

DEFINITIONS,

FOR THE PURPOSES OF THIS ARTICLE, THE FOLLOWING DEFINITIONS APPLY:

"RADIOACTIVE MATERIALS" ARE ANY RADIOACTIVE WASTE PRODUCTS OR MATERIALS GENERATED, REFINED OR MADE RADIOACTIVE BY ANY UNITED STATES GOVERNMENT AGENCY OR PURSUANT TO FEDERAL OR STATE GOVERNMENT CONTRACT OR LICENSE AND INCLUDING THAT WHICH THE UNITED STATES NUCLEAR REGULATORY COMMISSION CLASSIFIED AS LOW-LEVEL RADIOACTIVE WASTE AS OF JANUARY 1, 1989, BUT WHICH MAY BE CLASSIFIED AS BELOW REGULATORY CONCERN WASTE AFTER THAT DATE.

"NUCLEAR WEAPON" IS ANY DEVICE, THE PURPOSES OF WHICH IS THE USE AS A WEAPON, A WEAPON PROTOTYPE, OR A WEAPON TEST DEVICE, THE INTENDED DETONATION OF WHICH RESULTS FROM THE ENERGY RELEASED BY FISSION AND/OR FUSION REACTIONS INVOLVING ATOMIC NUCLEI. "NUCLEAR WEAPON" INCLUDES THE WEAPONS GUIDANCE AND PROPULSION SYSTEM AND TRIGGERING MECHANISM, I.E., THE MEANS OF TRANSPORTING, BUILDING, PROPELLING, TRIGGERING OR DETONATING THE WEAPON, PROVIDED THAT SUCH MEANS IS DESTROYED OR RENDERED USELESS IN THE NORMAL TRANSPORTING, PROPELLING, TRIGGERING, OR DETONATION OF THE WEAPON.

"PERSON" MEANS A NATURAL PERSON, AS WELL AS A CORPORATION, INSTITUTION, OR OTHER ENTITY.

PROHIBITION OF STORAGE, USE OR DISPOSAL OF RADIOACTIVE MATERIALS.

EXCEPT AS SPECIFICALLY EXEMPTED IN THIS ARTICLE, NO PERSON SHALL IMPORT, STORE, INCINERATE, TREAT, PROCESS, OR DISPOSE OF RADIOACTIVE MATERIALS, FOR ANY PURPOSE, WITHIN THE LANDS OF THE WESTERN SHOSHONE NATION, OR WITHIN LAND FILLS OR INCINERATORS OWNED OR LICENSED BY THE WESTERN SHOSHONE NATION.

PROHIBITION OF NUCLEAR WEAPONS WORK.

NO PERSON SHALL KNOWINGLY, WITHIN THE LANDS OF THE WESTERN SHOSHONE NATION, DESIGN, TEST, PRODUCE, LAUNCH, MAINTAIN, OR STORE NUCLEAR WEAPONS OR COMPONENTS OF NUCLEAR WEAPONS.

PROHIBITION OF NUCLEAR REACTORS.

NO PERSON SHALL CONSTRUCT, OPERATE, A NUCLEAR REACTOR WITHIN THE LANDS OF THE WESTERN SHOSHONE NATION.

PROHIBITION OF URANIUM AND MILLING.

NO PERSON SHALL CONSTRUCT OR OPERATE A URANIUM MINE OR MILLING OPERATION WITHIN THE LANDS OF THE WESTERN SHOSHONE NATION.

MIGRATION OF RADIOACTIVE MATERIALS.

NO PERSON OR OTHER NATION SHALL ALLOW THE MIGRATION OF RADIOACTIVE MATERIALS FROM NEIGHBORING LANDS INTO THE LANDS OF THE WESTERN SHOSHONE NATION.

NUCLEAR FREE ZONE SIGNS

THE WESTERN SHOSHONE NATIONAL COUNCIL SHALL POST AND MAINTAIN APPROPRIATE SIGNS AT ALL RECOGNIZED ENTRANCES TO THE LANDS OF THE WESTERN SHOSHONE NATION, AT ENTRANCES TO THE YUCCA MOUNTAIN FACILITY AND THE NEVADA NUCLEAR TEST SITE, AND THE NATIONAL COUNCIL OFFICE IN CACTUS SPRINGS, PROCLAIMING THE WESTERN SHOSHONE NATION'S STATUS AS A NUCLEAR FREE ZONE.

ENFORCEMENT

EACH VIOLATION OF THIS SECTION SHALL BE PUNISHABLE BY A $1,000,000 FINE. EACH DAY OF VIOLATION SHALL BE DEEMED A SEPARATE VIOLATION. ENFORCEMENT WILL BE BY A DULY AUTHORIZED AGENT OF THE WESTERN SHOSHONE NATION.

THIS DECLARATION IS HEREBY ENACTED ON THIS 2ND DAY OF DECEMBER 1995 BY CONSENSUS OF THE WESTERN SHOSHONE NATIONAL COUNCIL.

RAYMOND D. YOWELL, CHIEF

ATTACHMENTS: BOUNDARY DESCRIPTION AND MAP OF NEWE SOGOBIA AS DEFINED BY THE WESTERN SHOSHONE NATIONAL COUNCIL.

Response
DOE acknowledges the concerns and position taken by the Western Shoshone National Council. The Department appreciates this participation.

5.1 (12586)
Comment - 010432 / 0002
I also believe that this is very likely to turn into permanent storage, because people do not want this stored around them.

Response
Although the spent nuclear fuel and high-level radioactive waste that would be placed in Yucca Mountain could be retrieved for more than 300 years, the repository is proposed as a permanent disposal site.

5.2 Support for the Proposed Action

5.2 (26)
Comment - 236 comments summarized
Commenters expressed broad general support for the Proposed Action to construct, operate and monitor, and eventually close a geologic repository at Yucca Mountain for the disposal of spent nuclear fuel and high-level radioactive waste. Commenters stated that they were in favor of the repository or that they did not want to burden future generations, or they cited one or more examples from a range of positive attributes associated with the repository. Other commenters expressed support for the Proposed Action by stating their opposition to the No-Action Alternative and the need to move forward with the proposed Yucca Mountain Repository. Commenters also expressed support for a Yucca Mountain Repository because utility companies need DOE to remove existing inventories of spent nuclear fuel from temporary storage at their powerplants--a process that ratepayers and utilities have been supporting with payments into the Nuclear Waste Fund. In addition, some commenters expressed support for a Yucca Mountain Repository and favored monitored retrievable storage as part of the operations at the Yucca Mountain site.

Response
DOE acknowledges that there is support for, as well as opposition to, the proposed repository at Yucca Mountain and the associated analyses presented in the EIS. Because of the large number of comments received in general support of the repository, DOE refers the commenters who have submitted comments summarized here to the discussion of issues at the beginning of this Comment-Response Document and to other comments and responses related to specific topics of interest (see the Comment-Response Document Table of Contents).

DOE considers the Proposed Action to be consistent with its responsibilities under the NWPA.

5.2 (10936)
Comment - EIS000479 / 0003
South Carolina has done its share for both the defense of the country and ensuring the safe disposal of most of the nation's commercial low-level radioactive waste. Failure to develop the site at Yucca Mountain could have an adverse effect on the work carried out at the Savannah River Site, as South Carolina is hesitant to continue accepting waste that has no clear path for final disposition.

Response
In accordance with the NWPA, DOE is conducting site characterization activities only at Yucca Mountain to determine its suitability as a potential repository for the Nation's spent nuclear fuel and high-level radioactive waste. The Department is carrying out the requirements of the Act in preparing this EIS, and in doing so, is also pursing the resolution to the problem of management of the existing and expected future inventory of spent nuclear fuel and high-level radioactive waste. The Department has allocated all Savannah River Site spent nuclear fuel and high-level radioactive waste to the Yucca Mountain Site if it is approved for development.

DOE is proceeding toward a site recommendation determination. Assuming that both the Secretary of Energy and the President recommend Yucca Mountain as the repository site, and Congress, if necessary, passes a resolution of repository siting approval, DOE would submit a License Application to the Nuclear Regulatory Commission and would expect to begin accepting spent nuclear fuel in 2010.

5.3 Support for the No-Action Alternative

5.3 (164)
Comment - 303 comments summarized
Commenters stated that spent nuclear fuel and high-level radioactive waste should be left where it is stored now or stored and disposed of in a manner that eliminates the need to transport it to a repository at Yucca Mountain. Many commenters support a No-Action Alternative that would keep spent nuclear fuel at the commercial reactor sites and in the states where the spent nuclear fuel and high-level radioactive waste is produced. Some commenters expressed a preference for monitored retrievable onsite storage. Other commenters expressed the belief that technological

advances in the future will allow better alternatives to a repository at Yucca Mountain and that radioactive waste should be left where it is until these technologies are available. Commenters also suggested that requiring the commercial generators to store spent nuclear fuel onsite would serve to stop production while forcing DOE and the utilities to find viable alternatives for energy production and safe disposal methods. Other commenters felt that leaving the material where it is would prevent taxpayers from bearing costs associated with the transportation and disposal of spent nuclear fuel and high-level radioactive waste.

Some commenters said that, because the EIS states that onsite storage is safe for hundreds if not thousands of years, spent nuclear fuel can remain at the sources until more definitive approaches to waste management are proven. These commenters believe that this would eliminate transportation risks. The commenters expressing support for leaving the waste where it is now stated the following: If spent nuclear fuel is safe left on the sites for the next 100 years, and the national waste management program is intended to protect human health and safety, then leaving the waste at the generator sites and pursuing other management options have merit; keep wastes on the sites until the consequences of operating a repository are completely understood; it is better if wastes are in peoples' backyards so it is not "out of sight, out of mind"; DOE should take possession of and manage the waste on the generator sites; the No-Action Alternative is preferable because it is too risky to transport spent nuclear fuel and high-level radioactive waste across the country; nothing bad has happened storing it where it is now, so why add the risk of transportation to Yucca Mountain; if the casks for Yucca Mountain are so safe, they can be used at the generator sites instead; entomb radioactive waste where it was created; and make the cooling ponds bigger at the nuclear powerplants. Other commenters stated that generator sites are already contaminated, so removing wastes from the generators would still leave radioactive sites; storing spent nuclear fuel and high-level radioactive waste at the scattered locations represented by the 77 separate commercial and DOE facilities decreases the severity of possible problems from storage accidents; and DOE should spend the money obligated for Yucca Mountain to build safe storage facilities on the sites where the property is already contaminated, thus avoiding the expense and dangers of transporting spent nuclear fuel and high-level radioactive waste across the country.

Commenters in favor of leaving wastes in place in monitored above-ground storage provided such Comments as the following: onsite storage locations already have trained personnel; above-ground storage can be monitored for the foreseeable future; if something happened to radioactive wastes stored above ground, it would be more convenient than an underground repository to make needed repairs or clean up leaks; the generally low population density surrounding the commercial powerplants would minimize accident consequences; DOE should accept responsibility for above-ground storage at the generator sites; spent nuclear fuel should be stored on site in the containers designed for use at Yucca Mountain; and above-ground storage would allow time to conduct research for better long-term plans, as well as time for wastes to cool and short-lived radionuclides to decay, thereby reducing the radioactive content of waste to be managed. A few commenters suggested storing spent nuclear fuel in the reactor containment building after closure of the powerplant.

Response

DOE acknowledges that onsite storage systems, such as spent nuclear fuel storage pools, have been operated for several decades without undue risk to the general public or nuclear powerplant personnel. The majority of these systems are wet and, by design, active systems. Such storage systems require continuous technical and management oversight of process equipment (such as water-cooling, water-treatment, and leak-detection systems). More recently, some commercial utilities have constructed dry storage facilities. While these facilities do not require active cooling systems, they must be routinely monitored to ensure compliance with regulatory environmental protection standards. In addition, 24-hour security measures must be provided to safeguard the stored material.

While commenters are correct that the present storage sites can continue to store spent nuclear fuel and high-level radioactive waste safely in the short term, the NWPA requires DOE to evaluate the Yucca Mountain site for long-term disposal of these materials and then to proceed with disposal if the site was recommended and approved for development of a repository. Although the NWPA does not direct DOE to examine continuing storage at existing sites, DOE provided the No-Action Alternative in the EIS as a basis for comparison with the Proposed Action. In the event the Yucca Mountain site was not approved, DOE would prepare a report to Congress, as required by the NWPA, with its recommendations for further action to ensure safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for any new legislative authority. Under any future course that would include continued storage, DOE would have an obligation to continue managing DOE spent nuclear fuel and high-level radioactive waste in a manner that protects public health and safety and the environment. The issues and

concerns expressed by the commenters represent the range of factors that would be considered in future recommendations, including transportation requirements. However, the course that Congress, DOE, and the commercial utilities would take if Yucca Mountain was not approved for repository development is uncertain.

Chapter 7 of the EIS provides a discussion of the No-Action Alternative and estimates of the potential environmental impacts of continued storage at the generator sites (for example, see Section 7.2.1.7.3 for the expected radiation exposure from continued long-term storage). Chapter 6 of the EIS provides estimates of transportation-related impacts. These assessments include a range of scenarios that include "cooler," or aged spent nuclear fuel. It is true that, as spent nuclear fuel and high-level radioactive waste age, the radioactivity of these materials decreases. However, most of the 72 commercial nuclear facilities could continue to accumulate freshly irradiated spent nuclear fuels for decades into the future. DOE has no authority over the operation of the Nation's commercial nuclear powerplants. The role the nuclear powerplants will play in the future of the Nation depends on the relicensing of such powerplants by the NRC and future power generation decisions made by each commercial utility. DOE recognizes, as do the commenters, that as nuclear powerplants continue to operate, they will continue to produce spent nuclear fuel.

With regard to possible redirection of monies contained in the Nuclear Waste Fund for development of alternative sources of energy or development of new technologies for waste management, expenditures from the Nuclear Waste Fund are exclusively for the purposes specified in the Nuclear Waste Policy Act of 1982, such as site characterization.

Congress has directed DOE to study accelerator transmutation of radioactive waste, although such research is not funded by the Nuclear Waste Fund. However, even if transmutation becomes a practical technology, a repository would still be an essential element of the nuclear fuel cycle because significant quantities of highly radioactive, long-lived materials would remain. Therefore, the Department does not recommend abandoning the Nation's current waste management strategies.

5.3 (6523)
Comment - EIS001380 / 0001
The absolute most compelling reason why I favor the NO ACTION option is that I, as a citizen should not have to bear additional costs to transport and store at Yucca Mountain, NV commercial nuclear power plant wastes. These costs could easily have been anticipated and budgeted for by the industry. It seems that having the spent fuel rods kept on site in relatively small amounts (compared to concentrating everything at Yucca Mountain), where they can be monitored, makes good sense. I believe there was a rush to judgment by Congress, probably based on nuclear power industry and governmental agency lobbying, for the central U.S. site.

Response
The "Findings" section of the Nuclear Waste Policy Act of 1982 states that "while the Federal Government has the responsibility to provide for the permanent disposal of high-level radioactive waste and such spent nuclear fuel as may be disposed of in order to protect the public health and safety and the environment, the costs of such disposal should be the responsibility of the generators and owners of such waste and spent fuel."

Section 302 the Nuclear Waste Policy Act of 1982 states that "in return for the payment of fees established by this section, the Secretary, beginning not later than January 31, 1998, will dispose of the high-level radioactive waste or spent nuclear fuel involved as provided in this subtitle." Since the passage of the Act in 1982, utilities and their ratepayers have paid approximately $9.8 billion into the Nuclear Waste Fund to pay for development of a repository for high-level waste and spent nuclear fuel. By the end of Fiscal Year 1999 (September 30, 1999), the program had spent approximately $6 billion for the specified purposes. As reported in the *Report on Assessment of Fee Adequacy Based on FY 1999 Total System Life Cycle Cost Update* (DIRS 152076-CRWMS M&O 1999), the Nuclear Waste Fund investments had a market value of $8.6 billion by September 30, 1998, due to accrued interest on the funds.

DOE periodically assesses the adequacy of the Nuclear Waste Fund, and to date has always found that the fund is adequate to pay for investigations, design, licensing, operating, monitoring, and closing a repository. Taxpayers would bear some of the cost of the repository because approximately 30 percent of the cost of the repository is attributed to disposal of spent nuclear fuel and high-level radioactive waste from National defense and research programs.

In passing the NWPA, Congress established that the Federal Government is responsible for the permanent disposal of spent nuclear fuel and high-level radioactive waste. To that end, Congress directed the Secretary of Energy to determine whether to recommend to the President that the Yucca Mountain site be approved for development of a repository for the permanent disposal of these materials. This Act makes it the policy of the U.S. Government to determine whether geologic disposal at Yucca Mountain is safe. The Act does not direct DOE to examine any other methods of storage or disposal, nor does it direct DOE to examine continuing storage at existing sites.

5.4 Cost of Proposed Action or No-Action Alternative

5.4 (219)
Comment - 56 comments summarized
Commenters stated that this project is, at best, very expensive and risky, and question why the Federal Government is taking the responsibility for commercial spent nuclear fuel, "bailing out" the nuclear power industry. Commenters stated that utilities were trying to get taxpayers to shoulder the cost of disposal of spent nuclear fuel, and that they are pressuring Congress to avoid the cost burden and responsibility for their radioactive waste. Commenters called the use of taxes to pay for the development of a repository a subsidy for the utility industry, and they do not believe that taxpayers should get "stuck" with the bill that the nuclear industry, utility shareholders, municipalities, and others that directly benefit from nuclear power generation should pay. Other commenters stated that the responsibility for the waste should return to the states. Commenters expressed a concern that the money be spent wisely. Commenters also expressed concerns that taxpayers would have to accept cost and liability for accidents or other impacts that could occur in relation to transportation of spent nuclear fuel and high-level radioactive waste or operation of the repository. Commenters stated it was not clear why utilities should be allowed to continue to produce waste if they are not able to safely store the waste they have already produced.

Response
As described below, approximately 70 percent of the estimated repository-related costs would be funded by commercial nuclear power generating utilities via the Nuclear Waste Fund. The Nuclear Waste Fund would cover the costs associated with disposal of commercial spent nuclear fuel. The remaining 30 percent would be funded by taxpayers, which would cover the Federal Government's portion of the costs related to the disposal of high-level radioactive waste, spent nuclear fuel from the Naval Nuclear Propulsion Program, and spent nuclear fuel from defense and research reactors.

In the "Findings" section of the Nuclear Waste Policy Act of 1982, Congress stated that "...while the Federal Government has the responsibility to provide for the permanent disposal of high-level radioactive waste and such spent nuclear fuel as may be disposed of in order to protect the public health and safety and the environment, the costs of such disposal should be the responsibility of the generators and owners of such waste and spent fuel..." Since the passage of the Act, nuclear power generating utilities and their ratepayers have paid about $9.8 billion into the Nuclear Waste Fund to pay for development of a repository. Expenditures from the Fund have been used exclusively for the purposes specified in the Act, such as site characterization, facility design, and site recommendation studies.

Section 302 of the Nuclear Waste Policy Act of 1982 specifies that funding for disposal of commercial spent nuclear fuel is provided by payment of fees to the Secretary of Energy by the generators of electricity from nuclear power plants. Equivalent amounts are paid by the Federal Government to cover costs associated with disposal of spent nuclear fuel or high-level radioactive waste generated or owned by the United States. Utility fees and Federal appropriations are required to be sufficient to offset expenditures associated with repository studies, transportation, and operations and closure of a repository, as determined by an annual review by the Secretary of Energy. The utility fees and Federally funded share are subject to change based on a required annual review of adequacy. The utility fees go into the Nuclear Waste Fund, which is administered by the Secretary of the Treasury. Excess funds for any given year, as determined by the Secretary of Energy, are invested in obligations of the United States and earn interest. The Secretary of Energy makes expenditures from the Nuclear Waste Fund subject to appropriations by Congress. Congress also appropriates the funds from taxpayer revenues to cover the cost of disposing spent nuclear fuel (including spent nuclear fuel from foreign countries subject to the conditions of the Nuclear Non-Proliferation Act of 1978 or with Presidential approval) and high-level radioactive waste generated or owned by the United States. These materials were produced primarily at DOE defense production facilities. As noted above,

taxpayers fund only the management and disposal of DOE produced and owned materials; disposal of commercial spent nuclear fuel is funded by the generators. The most recent estimates show that approximately 70 percent of repository-related costs would be paid from the Nuclear Waste Fund and about 30 percent from taxpayer revenues. This percentage is based on the space required to dispose of defense-related spent nuclear fuel and high-level radioactive waste. Thus, the commercial utilities are "paying their fair share" of repository program costs along with taxpayers.

As reported in *Nuclear Waste Fund Fee Adequacy: An Assessment*, the nuclear waste fund investments had a market value of $8.5 billion as of September 30, 1999 (DIRS 153257-DOE 2001). The analysis in the report found that the current fee of 1 mil (one-tenth of one cent) per kilowatt-hour charged to generators of commercial spent nuclear fuel is adequate to cover projected disposal expenses (including costs associated with packaging and transportation) and recommended that the fee remain unchanged.

With regard to what has been accomplished to date, characterization activities at the Yucca Mountain site have yielded sufficient data to determine the suitability for a recommendation for further development. DOE is proceeding as expeditiously as possible toward making a determination on whether to recommend that the President approve the site. If the site is recommended and the President accepts the recommendation and Congress passes a resolution of repository siting approval, if necessary, DOE plans to submit a License Application to the NRC to begin accepting spent nuclear fuel and high-level radioactive waste in 2010.

As discussed in Section 9.1.3 of the EIS, DOE continues to evaluate new technologies (such as accelerator transmutation of waste) to reduce the potential effects of the repository project. However, DOE cannot expend any funds not authorized and appropriated by Congress. The broader effort advocated by the some commenters would require appropriation of funds by Congress, and except on a limited basis, funds for investigation of alternative methods of management of spent nuclear fuel and high-level radioactive waste have not been appropriated.

In 1988, the Price-Anderson Act was amended to provide liability coverage to DOE activities (including transportation) involving spent nuclear fuel, high-level radioactive waste, and transuranic waste. The Price-Anderson Act provides liability coverage for DOE and commercial activities operating under a license from the Nuclear Regulatory Commission by establishing a system of private insurance and Federal indemnification that generally ensures that up to $9.43 billion is available to compensate for damages suffered by the public, regardless of who causes the damage. Payment would be from Federal Government funds or, if public liability arose out of nuclear waste activities funded by the Nuclear Waste fund (for example, activities at a geologic repository), from the Nuclear Waste Fund. Appendix M of the Final EIS contains more information.

With regard to continued production of spent nuclear fuel, commercial nuclear powerplants currently produce approximately 20 percent of the total electric power generated nationwide. The role nuclear powerplants will play in the future of the Nation depends in part on the relicensing and future power generation decisions made by each commercial utility, pursuant to the regulations of the Nuclear Regulatory Commission. As long as nuclear powerplants continue to operate, they will continue to produce spent nuclear fuel. If a repository becomes operational and meets its volume limitation, the issues of where and how to manage additional spent nuclear fuel would require decisions on the national level.

With regard to safe storage, the Nuclear Regulatory Commission determined, through extensive safety reviews prior to issuance of operating licenses, that commercial nuclear powerplants have adequately designed facilities and implementing procedures to ensure safe onsite storage of spent nuclear fuel. In addition, with the Waste Confidence Findings (10 CFR 51.23), the Commission determined " … that, if necessary, spent nuclear fuel generated at any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license of that reactor) at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installations."

5.4 (248)
Comment - 4 comments summarized
Commenters recommended that the alternatives presented in the Draft EIS should focus on a comparative presentation of benefits (such as risk minimization) and cost of various alternatives for repository and related transportation system development and operation to aid DOE and congressional decisionmakers. Commenters also

suggested that the presentation include a discussion of risk management benefits and the costs of the use alternative construction materials. Another commenter suggested that additional information be provided related to the cost associated with the waste staging facility.

Response
With regard to estimated project costs, DOE believes it appropriate to provide the details of the cost estimates in reference documents; therefore, the cost discussions in the EIS are brief. The estimated cost information presented in Final EIS Section 2.1.5 was provided as a point of comparison between the Proposed Action and the No-Action Alternative. The cost estimate presented in this Final EIS has been revised to reflect design updates (including various construction options and the staging facility). The transportation information presented is independent of design updates and is the highest estimated cost factoring in mode and route options. Differences in Nevada transportation cost estimates were presented in Draft EIS Section S.4.2.2. These cost estimates have been updated and incorporated in Sections S.4.2.2 and 6.3 of the Final EIS.

The discussion in the EIS with regard to potential impacts (environmental and economic) that could result from either the Proposed Action or the No-Action Alternative provides information for the Secretary of Energy so that a determination can be made whether to recommend Yucca Mountain as the site for the Nation's first monitored geologic repository. In making that determination, the Secretary would also consider not only the environmental impacts and the costs and benefits of not only the Proposed Action identified in the EIS, but also other technical, economic, and national policy factors and provided in the Science and Engineering Report (DIRS 153849-DOE 2001) and as dictated by the NWPA.

With regard to the risk management benefits and costs associated with alternative construction materials, commenters are referred to Section 10.3.1 of the EIS, which discusses irreversible or irretrievable commitments of resources including construction materials. Commenters are also referred to Section 10.2 of the EIS, which describes and compares the relationship of resource use to long-term productivity.

5.4 (427)
Comment - EIS000103 / 0001
My report is on transportation. In the summary of the EIS and the VA [Viability Assessment], you mention that there will not only be one repository but two, cost 25 billion for the first and 35 I put in for the record, but people do not realize that these numbers do not represent anything more than the cost for the repositories.

It doesn't state how much transportation, how much this, how that will do, and that must be made clear.

Response
DOE believes the comment refers to Section S.2.2.3 in the EIS Summary, which notes that the Nuclear Waste Policy Act, as amended, directs that the amount of spent nuclear fuel and high-level radioactive waste for repository disposal cannot exceed 70,000 metric tons of heavy metal (MTHM) until a second repository is in operation. This is why DOE structured the Proposed Action of the EIS to analyze the disposal of 70,000 MTHM, while disposal of additional reasonably foreseeable waste inventories exceeding 70,000 MTHM are analyzed as part of cumulative impacts (see Chapter 8 of the EIS). Legislative action would be necessary before DOE could dispose of more than 70,000 MTHM in a Yucca Mountain Repository unless a second repository was in operation. At present, there are no plans or ongoing activities associated with a second repository site. The NWPA limited ongoing characterization and consideration to the Yucca Mountain site. Section 161(a) of the NWPA states, "The Secretary [of Energy] may not conduct site-specific activities with respect to a second repository unless Congress has specifically authorized and appropriated funds for such activities."

Section 2.1.5 of the EIS presents cost estimates for the proposed Yucca Mountain Repository (including costs for transportation, repository development, construction, operation and monitoring, and closure). It also includes costs of waste acceptance, storage, and national transportation; Nevada transportation; program integration (quality assurance, human resources and administration, Nuclear Regulatory Commission fees, and Nuclear Waste Technical Review Board funding); and program institutional costs (payments-equal-to-taxes, benefits payments to the State of Nevada, transportation training assistance, and other financial assistance payments). Section 2.2.3 presents cost estimates for the No-Action Alternative. DOE based these estimates on the best available data and standard cost-estimating techniques.

DOE developed these estimates for comparative purposes and to aid decisionmakers in discriminating between the Proposed Action and the No-Action Alternative discussed in the EIS. The estimates do not include costs before early 2002, when DOE anticipates a decision on repository development, or the costs for siting and characterization of Yucca Mountain. The No-Action estimate includes only costs that differ from those of the Proposed Action estimate. For example, it does not include storage costs until 2010, when a repository (if approved) would first accept spent nuclear fuel and high-level radioactive waste because storage would be necessary until then under both the Proposed Action and the No-Action Alternative. The No-Action estimate is based on and consistent with industry experience for dry storage of spent nuclear fuel and high-level radioactive waste.

5.4 (1671)
Comment - EIS000461 / 0005
They came out with the idea it was too cheap to meter. That's because they never thought about opposition. They never asked the general public what they would think about having this stuff for and thousands of years to take care of high-level radioactive waste out there. But now you've got it. Now you're worried about it going up. That's too bad. You should have thought about that ahead of time. You are chasing the almighty dollar. It's not our fault you're spending too much damn money on something nobody really wants. That's the idea you have to take into account.

Response
Thank you for your comment.

5.4 (1738)
Comment - EIS001837 / 0031
The only funds that should have been spent are with regard to this project are, perhaps, the funds to assess the health and safety risk of producing nuclear waste. This study would have shown that nuclear plants must be immediately replaced by safe forms of energy production such as hydrogen fuel from green algae, wind and solar.

Response
Under the Nuclear Waste Policy Act of 1982, the policy of this country is for DOE to dispose of spent nuclear fuel and high-level radioactive waste by geologic disposal. Section 114(f)(1) of the Act specifically requires the EIS, stating in part that "A final environmental impact statement prepared by the Secretary under such Act shall accompany any recommendation to the President to approve a site for a repository." In addition, the Act requires the commercial generators of spent nuclear fuel (that is, utilities) to pay the costs of disposal through a fee of 1 mil (one tenth of one cent) for every kilowatt-hour of electricity generated at commercial nuclear plants. Equivalent amounts are paid by the Federal Government to cover similar costs associated with disposal of spent nuclear fuel or high-level radioactive waste generated or owned by the United States. In short, preparation of and funding for this EIS, as well as other activities of the Yucca Mountain Project, are specified by and consistent with the NWPA. Speculation regarding the phaseout of nuclear power and replacement with alternative energy sources is beyond the scope of this EIS.

5.4 (2257)
Comment - EIS001256 / 0010
In cost-benefit analyses, the DEIS fails to include all the cost to the affected populations and to the environment due to potential failures of control. If control is not maintained, how would people and the environment be affected?

Response
DOE assumes that this Comment, when referring to "failures of control," means a loss of institutional control. Chapter 5 of the EIS addresses potential human-health impacts from radioactive and nonradioactive materials that the proposed repository at Yucca Mountain could release to the environment during the first 10,000 years after closure. As indicated in Section 2.4, DOE does not expect the long-term consequences to the public and the environment after repository closure and decommissioning (50 to more than 300 years after waste emplacement) to be significant.

Section 2.1.2.3 of the EIS and Science and Engineering Report Sections 2.5, 4.1.5, and 4.6 discuss repository closure activities, including the use of institutional controls such as land and warning systems to limit or prevent intentional and unintentional activities in and around the closed repository. Monuments would be designed,

fabricated, and placed to be as permanent as practicable. The analysis of potential environmental impacts contained in the EIS did not take credit for the effectiveness of these institutional controls. Section 5.7.1 of the EIS examines the potential environmental impacts that might result from an involuntary human intrusion into the repository (such as by a drilling operation). After closure, DOE would have the responsibility of maintaining institutional control over the repository, as required by the Energy Policy Act of 1992. Neither the extent nor the length of this regulatory requirement is well defined at present. However, consistent with the Nuclear Regulatory Commission regulations [10 CFR Part 63, particularly Section 63.102(k)], DOE would maintain appropriate institutional controls for as long as possible. However, as the Nuclear Regulatory Commission has also noted, although designs could attempt to warn potential intruders or mitigate effects associated with intrusion that does occur, they could not remove the potential for intrusion to occur.

Cost estimates of the No-Action Alternative are presented in Section 2.2.3 of the EIS and estimates of the Proposed Action are presented in Section 2.1.5. However, a specific cost-benefit analysis has not been performed because it is not necessary to support current decisionmaking. It is the Department's opinion that sufficient information about potential impacts to the public health, safety, and the environment is provided in the EIS to support current decisionmaking.

5.4 (2406)
Comment - EIS000674 / 0007
Finally, remember my comments about costs this morning. What's really bogus about the treatment of heavy-haul here, is it's probably the case that heavy-haul is a lot more expensive and has a lot more adverse impacts than a rail spur. If DOE had done their job here, I'd be here today having an honest debate with them on the issue that's pressing Mike Baughman. Which of those rail spurs looks more valid? Which has lower risk? But in fact, because the DEIS has thrown out all this garbage to make heavy-haul trucks look feasible, we need to work on that one first.

Response
Sections 6.3.2 and 6.3.3 of the Draft EIS discussed estimated impacts associated with Nevada rail transportation implementing alternatives (five rail corridors) and heavy-haul truck transportation implementing alternatives (five heavy-haul truck routes), respectively. Section S.4.2.2 in the Draft EIS Summary described estimated impacts and costs for the rail and heavy-haul truck implementing alternatives. Depending on the corridor or route selected, estimated rail and heavy-haul truck corridor costs would range from $258 million to $801 million and from $358 million to $619 million, respectively. DOE has noted the commenter's preference for rail over heavy-haul truck. Revised cost estimates are provided in Sections S.4.2.2 and 6.3 of the Final EIS for rail and heavy-haul truck.

5.4 (3102)
Comment - EIS000361 / 0004
The cost to ensure that the rural areas would be able to transport the radioactive waste would probably exceed the no-action alternative. Urban areas are too populated to transport it through and around.

Taking care of the radioactivity exposed would be costly. Finding alternative ways, although costly initially, would probably be less costly in the long run for two reasons: (1) The money that the commercial reactors set aside could pay for most of the cost; and, (2) When new uses are found, new money would be brought in and eventually the alternative pays for itself.

Finally, the cost of cleanup at the nuclear test site; cost to build new routes, rail or roads; and cost to clean up a radioactive accident would probably far exceed finding alternative ways to reuse this radioactive waste.

Response
The cost of transportation is included in the Proposed Action cost estimate in Section 2.1.5 of the EIS. Section 2.2.3 discusses the estimated cost of the No-Action Alternative.
The passage of the Nuclear Waste Policy Act of 1982 defined the Nation's policy for the disposition of spent nuclear fuel and high-level radioactive waste to be geologic disposal. Section 113 of the Act states that the EIS need not consider the need for a repository or alternatives to geologic disposal. Therefore, this EIS analyzes neither the environmental impacts nor the costs of alternative ways to reuse spent nuclear fuel or high-level radioactive waste. Section 2.1.5 of the EIS discusses estimated costs of the Proposed Action, including the costs of transportation, repository development, construction, operation and monitoring, and closure. As discussed in Section 4.1.8 in

relation to potential accidents at the repository and in Section 6.2.4 in relation to potential transportation accidents, the probability of release of significant quantities of radioactive materials would be very low. Therefore, cleanup costs of such accidents are not a factor in the cost estimates.

5.4 (4278)
Comment - EIS001160 / 0086
Page 2-58: It is not clear whether the costs shown in [Section 2.1.5] include expenditures on the Yucca Mountain Project to date. The table should explicitly show expenditures to date and projected expenditures in the future.

Response
The estimated costs of the Proposed Action listed in Section 2.1.5 of the EIS and the estimated costs of the No-Action Alternative listed in Section 2.2.3 are for comparative purposes only and cover the period from 2002 when a decision on whether to proceed with a Yucca Mountain Repository is expected. DOE anticipates before that time, activities for both the Proposed Action and the No-Action Alternatives will continue simultaneously. In addition, the No-Action costs do not include continued storage of spent nuclear fuel and high-level radioactive waste from the period from 2002 until shipments to a potential repository would begin in 2010 because continued storage would occur during that period under both the Proposed Action and the No-Action Alternative. DOE has clarified the text and tables to indicate that the cost estimates are for comparative purposes only.

DOE has estimated the total system life-cycle cost of a Yucca Mountain Repository flexible design in its report *Life-Cycle Cost Analysis for Repository Flexible Design Concepts* (DIRS 156900-DOE 2001). Historic costs (in 2001 dollars) from 1983 through 2001 were $8.8 billion. Future costs (in 2001 dollars) are estimated to range from $42.8 billion to $57.4 billion (see Section 2.1.5 of the EIS).

5.4 (4319)
Comment - EIS001210 / 0002
Since enactment of the Nuclear Waste Policy Act of 1982, the nation's ratepayers have paid more than $16 billion into the Nuclear Waste Fund for DOE to construct, operate and monitor a repository for high-level nuclear waste from commercial power plants across the nation. Thus far, DOE has spent more than $6 billion of these ratepayer contributions to characterize a geologic repository at Yucca Mountain.

Response
Thank you for your Comment.

5.4 (4320)
Comment - EIS001210 / 0003
Under either Scenario 1 or Scenario 2, the estimated cost of the No-Action Alternative, which ranges from $51.5 billion to approximately $5 trillion, greatly exceeds the estimated cost of $28.8 billion for DOE to fulfill its obligations. Furthermore, DOE's estimates in the DEIS do not take into account the total costs resulting from the No-Action Alternative. The potential costs of the premature shutdown of nuclear power plants and the consequent loss of 22 percent of the nation's electric supply should also be considered.

It would be inconceivable for DOE to pursue a No-Action Alternative and indefinitely strand high-level nuclear waste at plant sites at such high cost to the nation's ratepayers and potentially to the environment.

Response
The Department agrees with the commenter that costs associated with continued long-term storage of spent nuclear fuel and high-level radioactive waste at the generator sites would likely exceed the currently projected costs for design, construction, and eventual closure of the proposed repository. The Department also agrees with the commenter and the Nuclear Regulatory Commission that failure to develop a viable repository could result in the shutdown of operating commercial nuclear reactors before operating license expiration due to the lack of adequate spent nuclear fuel storage capacity, with an attendant loss of electric power generation for that area or region. While the Department recognizes that many environmental impacts could result from shutting down commercial nuclear reactors, a full evaluation of such impacts (such as generation of additional air pollution from a replacement sources of electricity) would be highly speculative because the choice of a replacement power source (importation, solar, gas, coal, etc.) would be regionally dependent and the utilities would make the ultimate decision. Because the

determination of local and regional impacts resulting from the loss of electric generating capacity for the shutdown reactors, including the potential for increased prices, would be speculative, the EIS does not include a detailed discussion.

By including long-term onsite storage as part of the No-Action Alternative, DOE is not positing conditions that would actually occur, nor is DOE suggesting that continued onsite storage represents an acceptable alternative to a repository at Yucca Mountain. In fact, DOE believes that both No-Action scenarios are unlikely, even though continued onsite storage of high-level radioactive waste and spent nuclear fuel would be necessary for some time if the Yucca Mountain site did not receive approval. If DOE did not recommend Yucca Mountain, it would, as directed by the NWPA [Section 113(c)(3)], prepare a report to Congress with its recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority.

5.4 (4605)
Comment - EIS001430 / 0002
I support the Preferred Alternative to proceed with the Proposed Action for 70,000 metric tons of heavy metal as described in section 2.6 of the draft EIS. This is partly because the short-term (about 100 years) impacts are small and the cost of the Proposed Action ($28.8 billion) is less than that of the No-Action Alternative ($51.5 to $56.7 billion).

Response
Thank you for your comment. The Final EIS provides updated cost information in Section 2.1.5.

5.4 (4638)
Comment - EIS001396 / 0003
The burden of paying for the mess made by nuclear waste generators will fall on American taxpayers. The Nuclear Waste Fund was created to pay for permanent storage of this waste when a suitable technology is found. The backup storage plan would allow for the absolutely needless and terribly risky transportation of nuclear waste before final approval of a permanent repository. Further, the costs associated with transporting the waste and cleaning up the accidents will be borne by taxpayers. Continued industry pursuit of interim storage schemes could leave a funding gap of many billions of dollars, leaving taxpayers holding the bag for the far more expensive job of permanent storage.

Response
The commenter implies that the Yucca Mountain Repository is a backup or interim plan for the disposition of spent nuclear fuel and high-level radioactive waste. The intent of the NWPA is to establish a geologic repository as a permanent disposal site. Consequently, this EIS does not characterize or analyze Yucca Mountain as an interim storage site.

5.4 (4698)
Comment - EIS001438 / 0002
Decades ago, DOE studies concluded that storing spent nuclear reactor fuel away from individual reactors would be fifty six percent more expensive than keeping the radioactive wastes on site. These billions of dollars might better be spent on research to improve reactor safety and towards the development of controlled fusion – in this century.

Response
The comparative cost estimate in Section 2.1.5 of the Final EIS indicates that the cost of constructing, operating and monitoring, and closing a repository at Yucca Mountain would range from approximately $42.8 billion to $57.4 billion (in 2001 dollars) from 2002 forward. The comparative No-Action Alternative cost estimate for the period from 2002 through 2110 would be between $55.7 billion to $61.3 billion; No-Action costs thereafter would be as much as $570 million per year. Common costs for the Proposed Action and No-Action Alternative are not included in either estimate (for example, the cost of continued storage of spent nuclear fuel from 2002 until initial receipt at a repository in 2010).

Congress determined through passage of the NWPA that the Federal Government has the responsibility to dispose of spent nuclear fuel and high-level radioactive waste permanently to protect the public health and safety and the

environment. To accomplish this objective, the Act directed the Department to characterize and evaluate the Yucca Mountain site and determine whether it is appropriate to make a recommendation to the President to develop the site as a repository.

The Nuclear Waste Policy Act of 1982 specifies that the generators and owners of spent nuclear fuel and high-level radioactive waste should pay for its disposal. Since the Act's passage, utilities and their ratepayers have paid approximately $9.8 billion into the Nuclear Waste Fund to pay for development of a repository for disposal of spent nuclear fuel and high-level radioactive waste. By the end of Fiscal Year 1999 (September), the program had spent approximately $6 billion. DOE has used these expenditures exclusively for the purposes specified in the NWPA; they are not available for other research such as development of controlled fusion.

Regarding evaluation of new technologies, DOE acknowledges that new technologies for waste management could be developed in the future. In fact, at the direction of Congress, DOE is studying accelerator transmutation of radioactive waste. The accelerator transmutation process involves state-of-the-art principles, some of which are not yet proven. However, even if this technology becomes feasible, a repository is an essential element of the nuclear fuel cycle because significant quantities of highly radioactive, long-lived materials would remain (see the discussion in Section 9.1.3 of EIS).

5.4 (4745)
Comment - EIS001450 / 0006
The question of long-term funding for stewardship of the site should also be addressed in the final EIS.

Response
As described below, approximately 70 percent of the estimated repository-related costs would be funded by commercial nuclear power generating utilities via the Nuclear Waste Fund. The Nuclear Waste Fund would cover the costs associated with disposal of commercial spent nuclear fuel. The remaining 30 percent would be funded by taxpayers, which would cover the Federal Government's portion of the costs related to the disposal of high-level radioactive waste, spent nuclear fuel from the Naval Nuclear Propulsion Program, and spent nuclear fuel from defense and research reactors.

The Nuclear Waste Policy Act of 1982 states that "...while the Federal Government has the responsibility to provide for the permanent disposal of high-level radioactive waste and such spent nuclear fuel as may be disposed of in order to protect the public health and safety and the environment, the costs of such disposal should be the responsibility of the generators and owners of such waste and spent fuel...." Since passage of the Act, nuclear power generating utilities and their ratepayers have paid approximately $9.8 billion into the Nuclear Waste Fund to pay for development of a repository for high-level radioactive waste and spent nuclear fuel. Taxpayers, however, also bear some of the costs of the repository, since approximately 30 percent of the cost of the repository is attributed to disposal of spent nuclear fuel and high-level radioactive waste from the United States' defense and research programs. Congress annually appropriates funds from taxpayer revenues to cover costs of disposing of this spent nuclear fuel and high-level radioactive waste. DOE periodically assesses the adequacy of the Nuclear Waste Fund and has always found that the fund is adequate to pay for investigating, designing, licensing, operating and monitoring, and closing a repository. This would include costs associated with long-term stewardship of the site. DOE believes that our elected representatives, having directed the Federal Government to embark on this project, would continue to fund it adequately to protect the health and safety of the public and the environment.

5.4 (4865)
Comment - EIS000337 / 0003
This DEIS attempts to paint a picture that the proposed action is the less costly by use of smoke and mirrors. A few months ago the reported costs for this project was over 60 billion, not including the cost of monitoring for thousands of years. The report now states the costs are 28.8 billion and would vary somewhat (pg. 2-59 1st par.) How much is "somewhat"? What is the track record for DOE in bringing projects within budget. They speak to all other areas of this project but have no data on how well they have managed past projects. DOE, as expected, priced the No-Action Alternative in the 50 billion range for the first 100 years. In this cost they included the decommissioning of Yucca Mountain.

Response
DOE based the cost estimates for development of a Yucca Mountain Repository in Section 2.1.5 and for the No-Action Alternative in Section 2.2.3 on the best available data and analysis techniques. The estimates are, however, for comparative purposes and as such do not include costs up to early 2002 when DOE anticipates a decision regarding future development of a Yucca Mountain Repository. Costs up to that point would be the same for both the Proposed Action and the No-Action Alternative.

DOE is unaware of a cost estimate of more than $60 billion for the project. However, *Life Cycle Cost Analysis for Repository Flexible Design Concepts* (DIRS 156900-DOE 2001) projected a total system life-cycle cost (in 2001 dollars) ranging from approximately $43 billion for the higher-temperature operating mode and from approximately $49 billion to $57 billion for the range of lower-temperature operating modes. Refer to Section 2.1.5 of the EIS for additional information.

The variation of costs mentioned in the comment would be due primarily to differences among the thermal load scenario selected for the repository design. Going from high thermal load to low thermal load would have increased the estimate by approximately 13 percent (DIRS 104980-CRWMS M&O 1999). The cost of decommissioning in the No-Action Alternative is not the cost of decommissioning a finished repository but rather the cost of dismantling current facilities associated with scientific studies to characterize the site and for reclamation of the site.

DOE has updated the EIS repository cost estimate in Section 2.1.5 of the EIS based on the latest information available for a flexible repository design (range of operating modes from higher- to lower-temperature) that includes features such as drip shields, a more robust waste package, and blending of commercial spent nuclear fuel to create a more uniform heat output from waste packages. Details of the updated cost estimates are available for review in the latest EIS cost report. In addition, clarification has been added that this cost estimate is only for comparison to the No-Action Alternative cost estimate. Costs prior to 2002 are reported for completeness.

5.4 (5428)
Comment - EIS001887 / 0127
Page 2-67; Section 2.2.3 - No-Action Alternative Costs

This cost analysis is of no substantive value because, as stated above, neither of the No-Action Alternative scenarios would ever be implemented. Therefore, any cost analysis or comparison in this Draft EIS is not relevant.

Response
As discussed in Chapter 7 of the EIS, DOE agrees that neither of the No-Action scenarios would be likely to occur if there was a decision not to construct a repository at Yucca Mountain. DOE disagrees, however, that the No-Action cost estimate is of no substantive value. Just as the environmental impact analysis provides an environmental impact basis for comparison to the Proposed Action, the cost estimate provides a basis for cost comparison.

5.4 (5439)
Comment - EIS001887 / 0134
Page 2-74; Section 2.4.2 - Short-Term Impacts of Repository Construction, Operation and Monitoring, and Closure

The Draft EIS states that the "estimated short-term (to 100 years) costs for the Proposed Action would be about $29 billion, and those for the No-Action Alternative would be as much as $57 billion for the same period." This statement is not only inaccurate, but gratuitous. As shown in Attachment T, the actual costs for implementing the Proposed Action will be almost $54 billion, even without many of the costly engineered fixes and alternatives that DOE has added to the project in the past two years. Furthermore, the analysis of the unrealistic No-Action Alternative scenarios provides no basis for comparison with the Proposed Action. The cost of storing spent fuel and HLW at generator sites, in the absence of a repository or central storage facility, would be closer to $4 to $5 billion (see discussion of on-site storage in Attachment T).

Response
DOE based the repository and No-Action cost estimates in Sections 2.1.5 and 2.2.3 of the EIS, respectively, on the best available information. It based the revised repository cost estimate in the Final EIS on 2001 dollars and added design features, which resulted in an overall estimate of approximately $42.8 billion to $57.4 billion. DOE updated the No-Action cost estimate to 2001 dollars, and estimated that the first 100 years of the No-Action Alternative would cost $55.7 billion to $61.3 billion.

5.4 (5560)
Comment - EIS001660 / 0048
The cost of clean up at the Nevada Test Site, cost to build new routes (rail or roads), cost to ensure precautions are being taken, cost to train emergency response staff, cost to clean up a radioactive accident, and cost to mitigate would probably far exceed finding alternative ways to reuse this radioactive waste. The EIS has an inadequate analysis of the costs. It should include analysis of the eventuality of the waste at Yucca Mountain; funds to monitor it, costs of drip shields, back fill, leaks and repair, and mitigation costs.

Response
The cost estimate in Section 2.1.5 of the EIS does consider transportation costs (including any new roads or rail lines) including the costs of reasonable precautions and training of emergency response staff. It also includes funds to monitor the waste until repository closure and any mitigation or repairs through closure. DOE has updated the Final EIS cost estimates to include the cost of drip shields because that feature is now part of the repository reference design. Because backfill of the emplacement drifts is not part of the reference design, it is not a part of the cost estimate. Although DOE would be responsible for the cost of accident cleanup, the annual probability of an accident that could release significant quantities of radioactivity is extremely small (less than 2 chances in 10 million for either truck or rail transport). Because the probability is so extremely low and the number of variables defining accident scenarios is large and therefore speculative, the cost of cleanup is not factored into the cost estimate. However, for information, DOE has presented the potential costs associated with cleanup of transportation accidents that could occur in Section J.1.4.2.5 of the EIS.

5.4 (5926)
Comment - EIS001619 / 0008
I also fear that the money invested, the billions of dollars already poured into this project, will be too much incentive to pull out of the program at this point. I think instead the money used for this project should be going to research on alternatives and education and outreach to the citizens of the United States, everyone.

Response
With the passage of the NWPA, Congress defined this country's policy for the disposition of spent nuclear fuel and high-level radioactive waste to be geologic disposal. Section 113 of the Act states that the EIS need not consider the need for a repository or alternatives to geologic disposal; therefore, DOE did not analyze either the environmental impacts or costs of alternative ways to reuse high-level radioactive waste or spent nuclear fuel in this EIS.

DOE is following the mandate of the NWPA to characterize the Yucca Mountain site and make a recommendation to the President regarding the suitability of Yucca Mountain as the location for a spent nuclear fuel and high-level radioactive waste repository. The results of DOE's characterization studies and the results of the environmental impact analysis in this EIS will form the basis for DOE's recommendation to the President.

5.4 (6134)
Comment - EIS001654 / 0039
The DEIS is required to address environmental impacts of the repository to satisfy the legal requirements of NEPA [National Environmental Policy Act]. Decision makers will have to also weigh the financial considerations of the alternatives to a far greater extent than this document provides. Section S.3.1.4 provides a cost estimate for the construction, transportation, operations and monitoring for the first 100 years of $28.8 billion.

The No-Action Alternatives would both cost between $51.5-56.7 billion for the same period. Scenario 1, however, would also require an additional $480-529 million annually for the remaining 9,900 years. In 1998 dollars, that amounts to about $5 trillion. That passes a monumental obligation to future generations, representing poor public

policy totally contrary to the underlying principle of inter-generational equity stated by national leaders since the 1970's.

Response
DOE agrees that costs will play a major role in shaping future decisions related to geologic disposal. However, most of the detailed cost information summarized in the EIS has been supplied by supporting documentation [for example, *Nuclear Waste Fee Adequacy: An Assessment* (DIRS 153257-DOE 2001) and *Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program* (DIRS 102031- DOE 1998)]. DOE prepared this EIS, consistent with the NWPA and Council on Environmental Quality regulations to provide information on environmental impacts that could result from the Proposed Action and a basis for comparison to the No-Action Alternative. The purpose of this information is support the Secretary of Energy's determination whether to recommend that the Yucca Mountain site be developed as the Nation's first monitored geologic repository. In making that determination, the Secretary will consider not only the potential environmental impacts identified in the EIS, as provided by the National Environmental Policy Act and the Nuclear Waste Policy Act, but also other factors such as technology, economics, and national policy.

5.4 (6231)
Comment - EIS001560 / 0003
All that I've been hearing today sounds vastly expensive. And this is expensive for a source of power that was originally called too cheap to meter. Well, it's far from it and we Clevelanders are very aware of cost overruns, especially lately. So all the costs from things like all the trucks and the trains, the armed escorts, all the workers that are required every step of the way, all the equipment, all the construction, the casks, all the everything, is amazingly expensive and we need to move away from it.

Response
DOE notes the commenter's concern about the expenses associated with the repository and appreciates your participation.

5.4 (6442)
Comment - EIS001632 / 0015
Page 2-58, Section 2.1.5: The discussion of "estimated costs" provides broad cost categories without an explanation of how these were derived. Also, there is no indication of how costs occur over time; no indication of the discount rate used to present all costs in 1998 dollars; and no indication of whether these are all direct costs of construction or if they include indirect costs such as that for siting the repository. TRW 1999e, the draft EIS cost summary report, is cited, but the final EIS should provide the reader more detail on costs.

Page 2-67, Section 2.2.3: The Comments for section 2.1.5 apply here also. In addition, Table 2-6 provides only limited information and leaves out how storage costs were developed and how these compare to industry estimates.

Response
The EIS focuses on analyses of potential environmental impacts, including impacts to human health and safety. DOE provided the estimated cost information as a point of comparison between the Proposed Action and the No-Action Alternative. The cost estimates in the Draft EIS were in 1998 dollars with no escalation or discount rates. The reference cited in the comment (DIRS 104980-CRWMS M&O 1999) provides the basis for the Proposed Action cost estimate for the period from 2002 to 2116. As stated in that reference, most of the detailed information came from existing cost estimates for the 1999 to 2116 period in the *Viability Assessment of a Repository at Yucca Mountain* (DIRS 101779-DOE 1998) and from the *Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program* (DIRS 102031-DOE 1998), which both provide detailed year-by-year cost estimates. The EIS estimates include all costs from 2002 forward (when DOE anticipates a decision regarding development of a repository at Yucca Mountain). Costs for the Proposed Action and the No-Action Alternative would be the same up to that time. Costs for siting and characterization of the Yucca Mountain site were not included in the Draft EIS estimates. Section 2.1.5 of the Final EIS provides revised cost estimates for the repository flexible design.

The No-Action Alternative cost estimate in Section 2.2.3 of the EIS is a comparative cost estimate and only includes costs different from the costs of the Proposed Action. For example, the No-Action costs do not include storage costs

until 2010 when a repository would first accept spent nuclear fuel and high-level radioactive waste because storage until that point would be required under both the Proposed Action and the No-Action Alternative. The No-Action cost estimate is based on, and consistent with, existing industry experience for dry onsite storage of spent nuclear fuel and high-level radioactive waste. Section 2.2.3 of the Final EIS provides revised cost estimates for the No-Action Alternative.

5.4 (7012)
Comment - EIS000402 / 0006
As a taxpayer, I am curious who is going to pay for the long term medical physical and mental problems. Who will be ultimately responsible, morally and financially for the damage done?

Response
In the vicinity of the repository—the area within 80 kilometers (50 miles)—DOE estimates that no individual would receive more than a few millirem (a thousandth of a rem) per year during the preclosure period (see Sections 4.1.2 and 4.1.7 of the EIS) or during the 10,000-year period following repository closure (see Section 5.4). At these low levels of exposure—which are below current and proposed regulatory limits—DOE expects that no radiation-related adverse health effects would occur. DOE would be responsible for any actual damage it caused.

5.4 (7188)
Comment - EIS001337 / 0078
Page 2-58 Section 2.1.5. It is not clear whether Table 2-5 includes costs already incurred by DOE for the Yucca Mountain site. The text and table should so indicate. The costs already incurred should be specifically identified in the text and on the table.

Response
The costs in Section 2.1.5 were developed for comparison to the No-Action Alternative costs and therefore include only costs from 2002, because that is when a decision is scheduled to be made about a repository at Yucca Mountain. Project costs up to that time would be the same regardless of whether a Yucca Mountain Repository was actually developed.

5.4 (7190)
Comment - EIS001337 / 0080
Page 2-61 Section 2.2.2.1. The text here should indicate for how long waste could be safely stored in dry-cask storage. What do the terms long-term and long periods mean? The cost and risk management benefits of on-site storage need to be introduced here and assessed in detail within the EIS. Ultimately, a simple comparison of the costs and risk management benefits of the Preferred and No-Action alternatives should be provided somewhere in the DEIS. This section should also discuss issues such as institutional control and sabotage and terrorism. Introduction of these concepts here is critical to subsequent analysis contained in latter sections to the DEIS.

Response
The purpose of this section of the EIS is to describe how nuclear utilities are currently managing spent nuclear fuel, not to present conclusions regarding safety and environmental impacts. Sections 2.2.2.2 and 2.2.2.3 of the EIS contain more detailed discussion of the No-Action Alternative scenarios. Chapter 7 describes a complete analysis of the potential environmental impacts, including human health and safety, associated with the No-Action Alternative scenarios. DOE's analysis assumes that all Nuclear Regulatory Commission safety regulations could be met as long as dry storage facilities continue to be monitored and maintained. In the context used in the Comment, "long-term" means more than a few years and is simply a recognition that utilities have constructed dry storage facilities in lieu of wet storage for spent nuclear fuel in almost every instance once their reactor pools were filled to capacity.

The EIS discusses cost estimates of the No-Action Alternative in Section 2.2.3 and environmental impacts in Chapter 7. Cost estimates of the Proposed Action are presented in Section 2.1.5 and environmental impacts of the Proposed Action are presented in Chapter 4 for preclosure impacts, in Chapter 5 for postclosure impacts, and in Chapter 6 for transportation impacts. Tables in Sections S.11.1 and 2.4.1 in the body of the EIS present a comparison of the impacts from the Proposed Action and the No-Action Alternatives.

The Department has clarified the descriptions of the Proposed Action and No-Action Alternative in Chapter 2 in relation to the concept of institutional controls. Since sabotage and terrorism are not part of the Proposed Action, it would be inappropriate to discuss such in Chapter 2; however, Section 4.1.8.3 includes analysis of potential sabotage events in relation to preclosure repository operations, and Section 6.2.4.2.3 discusses sabotage in relation to transportation.

5.4 (7452)
Comment - EIS001912 / 0030
Section 2.1.5. How can DOE estimate the cost of the proposed action when specific transportation modes have not been selected?

Response
The overall cost estimate of the Proposed Action in Section 2.1.5 of the EIS estimated $800 million as the cost of Nevada transportation, which would be for the most costly of the alternative modes and routes considered. Therefore, the cost estimates might be higher than actual costs that would occur. DOE has modified this section in the Final EIS to make this clarification and present the costs in 2001 dollars.

5.4 (7483)
Comment - EIS000817 / 0015
The costs and exposures of hauling this waste across the country and attempting to bury it will be way beyond what you expect -- expect the unexpected!

Response
DOE has used the best available information to estimate the costs and radiological risks of the Proposed Action.

5.4 (7840)
Comment - EIS001653 / 0029
Pg. 2-67 No-action alternative costs. How do these cost compare to other potential no-action alternatives such as reprocessing?

Response
The reprocessing of spent nuclear fuel is not a No-Action Alternative in the context of this EIS. The NWPA specifies geologic disposal of spent nuclear fuel and high-level radioactive waste as the policy of this country. It also specifies that this EIS need not consider alternatives to geologic disposal. Therefore, DOE has not analyzed the costs of reprocessing spent nuclear fuel and disposing of the resultant high-level radioactive waste.

5.4 (8034)
Comment - EIS000817 / 0078
P. 2-69 -- I also do not foresee that you won't have to replace some containers -- or even a lot of them -- at Yucca Mountain. Your "low cost" is based on not replacing containers, but if everything does not go as planned, they will need replacing.

Response
DOE has designed the waste packages with materials estimated to last thousands of years. Laboratory testing of the waste package materials, continued data gathering, and testing at the Yucca Mountain site is ongoing to confirm the estimates made by DOE. Under the current design, DOE does not expect any need to replace waste packages.

5.4 (8048)
Comment - EIS002001 / 0002
Money won't help us if we get sick, we'll have to pay our medical bills out of our own pocket. Think of all the people who can get sick.

Response
The estimated environmental impacts associated with the Proposed Action are presented in Chapter 4 of the EIS for preclosure impacts, Chapter 5 for postclosure impacts, and Chapter 6 for transportation impacts. Preclosure impacts, including transportation impacts, are estimated to be comparable to other industrial activities. Potential postclosure

human health impacts would result from very small chronic radiation doses. This EIS presents estimates of these potential human health impacts (latent cancer fatalities) to both individuals and the population to enable comparison of alternatives in this EIS. DOE believes that these impact estimates are conservatively high; in fact, the uncertainties are such that the actual level of impact could be zero (see Section F.1). However, the estimates of impacts present a common basis for comparison among the various alternatives so that the appropriate decisionmakers can make an informed decision regarding potential impacts.

In relation to the cost of treating potential cancers that could result from activities discussed in the EIS, even under the most hazardous transportation scenario (mostly truck) the estimated incremental increase in cancer fatalities (about 18 deaths over the 24-year shipping campaign) represents an increase over the natural occurrence of cancer fatalities from all causes of only 0.001 percent in the exposed population of 7.2 million. Further, the cost associated with treating this small number of additional cancers would be minuscule in comparison to the health care cost for the 7.2 million potentially exposed individuals and, therefore, would not provide useful information for the decisionmakers. Therefore, because DOE did not want to speculate on the health care costs associated with a highly uncertain and small estimated increase in cancer fatalities, the EIS does not include estimates of potential health care costs.

5.4 (8055)
Comment - EIS000391 / 0015
The cost of cleanup at the Nevada Test Site, cost to build new routes (rail or roads), and cost to clean up a radioactive accident would probably far exceed finding alternative ways to reuse this radioactive waste.

Response
The passage of the NWPA defined this Nation's policy for the disposition of spent nuclear fuel and high-level radioactive waste to be geologic disposal. Section 113 of the Act states that the EIS need not consider the need for a repository or alternatives to geologic disposal. Therefore, the EIS analyzes neither the environmental impacts nor the costs of alternative ways to reuse radioactive waste. Section 2.1.5 of the EIS discusses estimated costs of the Proposed Action, including costs for transportation, repository development, construction, operation and monitoring, and closure. As discussed in Section 4.1.8 in relation to potential accidents at the repository operations area, and in Section 6.2.4 in relation to potential transportation accidents, the probability of a release of significant quantities of radioactive materials would be very low. Also, the number of variables defining potential accident scenarios is large and therefore speculative. Therefore, cleanup costs of such potential accidents are not factored into the cost estimates. However, for information, DOE has presented the potential costs associated with cleanup of transportation accidents that could occur in Section J.1.4.2.5.

5.4 (8076)
Comment - EIS001653 / 0058
Pg. 4-2. How long will it take to construct the repository including all the emplacement tunnels? What is the total estimated cost of construction?

Response
Initial construction, assuming that the site is recommended, approved, and licensed, would begin in 2005, with initial emplacement of waste in 2010. Continuing emplacement drift construction would be concurrent with emplacement for approximately 22 years, and emplacement would continue for about 2 more years until 2034. Assuming closure began 50 years after the initial emplacement of waste (2060), the cost of the entire program, from 2002 through closure, would be between $42.8 billion and $57.4 billion in 2001 dollars. Of that amount, between $31.5 billion and $43.1 billion would be for construction and operation of a monitored geologic repository; $4.3 billion would be for waste acceptance, storage, and transportation; $800 million would be for Nevada transportation; up to $2.2 billion to $3.7 billion would be for program integration; and up to $3.9 billion to $5.4 billion would be for institutional programs. In addition, costs through 2001 would be approximately $9 billion. The cost estimate in Section 2.1.5 of the EIS has been updated to reflect this information. More detail is provided in *Life-Cycle Cost Analysis for Repository Flexible Design Concepts* (DIRS 156900-DOE 2001).

5.4 (8133)
Comment - EIS001842 / 0002
The life-cycle cost of the Yucca Mountain nuclear waste dump has been projected by the Department of Energy to be 150 billion dollars. I ask you, the DOE and the American people, to agree that the Yucca Mountain project is a monumental waste of time and money.

Response
DOE is not aware of an estimate of $150 billion. The NWPA specifies geologic disposal of high-level radioactive waste and spent nuclear fuel as the policy of this country. In addition, it requires commercial utilities to fund the cost of commercial spent nuclear fuel disposal and the Federal Government to fund the costs of disposing waste generated or owned by the United States. Section 2.1.5 discusses the costs for the Yucca Mountain Repository, and Section 2.2.3 discusses No-Action Alternative costs for comparison purposes.

5.4 (8351)
Comment - EIS001627 / 0003
There are also economic reasons why construction of a permanent repository is needed. Storing spent nuclear fuel at the reactor site, as the "no-action alternatives" indicate, is an expensive proposition. If DOE does not build the repository facilities soon, utilities will incur additional costs through the fact that they will have to store more spent fuel for a longer period of time. The DEIS shows that the construction of a repository at Yucca Mountain is by far the least expensive alternative.

If the Proposed Action plan is followed, the construction, operation and eventual closing of a permanent storage facility will cost $28.8 billion in 1998 dollars over the life of the project. Under the two scenarios set forth in the no-action alternative, the cost would be between $51.5 billion and $56.7 billion during the first 100 years. The estimated cost for the remaining period (9,900 years) of the first scenario would run between $480 million and $529 billion per year. The relatively low cost of building the Yucca Mountain repository, when compared with the alternatives, makes sense.

Response
Thank you for your comment.

5.4 (8370)
Comment - EIS001873 / 0055
P. 4-100. Waste retrieval should be included with costs of the Proposed Action.

Response
The need for retrieval of spent nuclear fuel and high-level radioactive waste from a repository at Yucca Mountain is not anticipated. However, the capability to retrieve would be maintained in accordance with the Nuclear Waste Policy Act of 1982 and applicable Nuclear Regulatory Commission regulations. Cost estimates include monitoring and the capability to retrieve the emplaced material, if necessary.

5.4 (8480)
Comment - EIS001568 / 0001
It's very frustrating when you see the costs involved with these projects. And I'm especially concerned with the Department of Energy that, you know, all your energy seems to be going into dealing with the problem after it exists. And I don't know if you're as frustrated with it as I am. But I'm just wondering, if we only have an eight percent net gain with nuclear energy in this country, why are we spending $30 billion just to deal with the high-level waste? Actually $15 billion on the waste that we will generate in only the next 10 years. Where are we spending money on developing energy efficiency policy in this country? Is there anyone in your office who has any budget for that? That's a question. I wonder if anyone can answer it.

Response
The Nuclear Waste Policy Act of 1982 establishes geologic disposal of spent nuclear fuel and high-level radioactive waste as a national policy. The generators of the waste are responsible for the costs associated with waste disposal through the Nuclear Waste Fund. Commercial utilities pay a fee of 1 mil (one tenth of 1 cent) per kilowatt-hour of electricity generated by nuclear energy to cover disposal costs for commercial spent nuclear fuel. The Federal

Government, through taxpayer revenues, pays for disposal of spent nuclear fuel and high-level radioactive waste generated and owned by the United States. The utility fees go into the Nuclear Waste Fund where unused portions earn investment income. Both the utility and Federally funded shares are subject to revision based on a required annual review of adequacy. The latest review found that the current 1 mil per kilowatt-hour would be adequate to cover projected disposal expenses and recommended that the fee remain unchanged. That review also showed that approximately 70 percent of disposal-related costs would be paid from the Nuclear Waste Fund and the remaining 30 percent is the only amount that would be paid from federal tax revenues.

Although not within the scope of this EIS, DOE has active and ongoing programs regarding energy efficiency policy. DOE's Office of Energy Efficiency and Renewable Energy is assigned that specific responsibility. Areas of focus include industrial technologies, transportation technologies, power technologies, and Federal energy management. Budgets for the four fiscal years from 1998 to 2002 for energy efficiency and renewable energy activities have averaged about $1 billion per year. More information regarding DOE's efforts in energy efficiency and renewable energy can be found on the Internet at http://www.eren.doe.gov.

5.4 (8543)
Comment - EIS002286 / 0002
I'd like to see in the final EIS the DOE addressing all the monies saved, gained, and lost by the nuclear industry opening Yucca Mountain.

Response
It would be inappropriate for DOE to label the payments made by utilities for spent nuclear fuel disposal, or the cost of other actions taken by the utilities to store spent nuclear fuel until a repository is in operation, as money saved, gained, or lost. DOE cannot make judgments on the net monetary impact that speculative actions could have on the nuclear industry, and such matters are outside the scope of this EIS.

The EIS considers the potential environmental impacts and costs associated with the Proposed Action and the No-Action Alternative. Section 2.1.5 of the EIS presents the estimated costs of the Proposed Action and Section 2.2.3 presents the estimated costs of the No-Action Alternative. Under the Nuclear Waste Policy Act of 1982, the policy of this country is for DOE to dispose of spent nuclear fuel and high-level radioactive waste by geologic disposal. Commercial utilities are responsible for the costs of disposal of commercial spent nuclear fuel and the Federal Government is responsible for the costs of disposing of waste generated or owned by the United States. The utility fees are currently specified under the Act to be 1 mil (one-tenth of one cent) for each kilowatt-hour of electricity generated by a civilian nuclear power reactor. The utility fees go into the Nuclear Waste Fund, which is administered by the Secretary of the Treasury. Congress also appropriates the funds from taxpayer revenues to cover the cost of disposing of spent nuclear fuel and high-level radioactive waste generated or owned by the Federal Government. The most recent estimates show that approximately 70 percent of repository-related costs would be paid from the Nuclear Waste Fund and about 30 percent from taxpayer revenues. Thus, the private commercial utilities are "paying their fair share" of repository program costs along with taxpayers.

5.4 (8566)
Comment - EIS001837 / 0001
People Against Radioactive Dumping (PARD) opposes further expenditures of public funds to enable the proposed Yucca Mountain nuclear dumping project to proceed. Both the Draft Environmental Impact Statement (DEIS) and the proposed rulemaking on 10 CFR 963 are enabling the Yucca Mountain project to continue while spending public funds without a vote of the people.

Response
DOE activities regarding this EIS and the issuance of revised site suitability regulations in 10 CFR Part 963 are in compliance with the NWPA. The EIS is specifically required under Section 114(f)(1) of the Act: "A final environmental impact statement prepared by the Secretary under such Act shall accompany any recommendation to the President to approve a site for a repository."

The DOE site suitability determination for a repository at Yucca Mountain is required by Section 113 of the NWPA. DOE site suitability regulations, promulgated in 10 CFR Part 963, establish the criteria and methodology by which DOE would determine whether the Yucca Mountain site is suitable as a location for a geologic repository. The site

suitability criteria and evaluation methods in 10 CFR Part 963 have been structured to be consistent with the Environmental Protection Agency environmental radiation protection standards in 40 CFR Part 197 and with the Nuclear Regulation Commission repository licensing requirements in 10 CFR Part 63. DOE's site suitability guidelines are based on the application of a Total System Performance Assessment to forecast potential repository-related releases. Under these guidelines, DOE could find that the Yucca Mountain site is suitable if specific criteria are satisfied and the results of the performance assessment show that the repository is likely to meet the applicable radiation protection standards for the preclosure and postclosure periods. These criteria are consistent with a longstanding policy to conform DOE regulations to the Environmental Protection Agency performance standard and comparable regulations of the Nuclear Regulatory Commission for the nuclear waste repository program.

As described below, approximately 70 percent of the estimated repository-related costs would be funded by commercial nuclear power generating utilities via the Nuclear Waste Fund. The Nuclear Waste Fund would cover the costs associated with disposal of commercial spent nuclear fuel. The remaining 30 percent would be funded by taxpayers, which would cover the Federal Government's portion of the costs related to the disposal of high-level radioactive waste, spent nuclear fuel from the Naval Nuclear Propulsion Program, and spent nuclear fuel from defense and research reactors.

Section 302 of the Nuclear Waste Policy Act of 1982 specifies that funding for disposal of commercial spent nuclear fuel is provided by payment of fees to the Secretary of Energy by the generators of electricity from nuclear powerplants. The Federal Government pays similar costs associated with disposal of spent nuclear fuel or high-level radioactive waste generated or owned by the United States, but would not be responsible for the costs associated with the disposal of commercial spent nuclear fuel. The utility fees go into the Nuclear Waste Fund, which is administered by the Secretary of the Treasury. The Secretary of Energy makes expenditures from the Nuclear Waste Fund subject to appropriations by Congress. Congress also appropriates the funds from taxpayer revenues to cover the cost of disposing of spent nuclear fuel and high-level radioactive waste generated or owned by the United States. The most recent estimates show that approximately 70 percent of repository-related costs would be paid from the Nuclear Waste Fund and 30 percent from taxpayer revenues.

Like all other Federal projects, Yucca Mountain activities are directed by applicable laws as enacted by the officials and representatives elected to office by the voting public, not by national referendum, and signed by the President.

5.4 (8670)
Comment - EIS001837 / 0030
We object to any further public fund allocations or promises associated with the Yucca Mt. DEIS or proposed project including funding for the Alameda Corridor. The DOE needs to go back to the drawing board, and get out of the business of nuclear waste dumping. Let the Nuclear Regulatory Commission manage the problem of existing waste and let them force the industry to clean up their own act.

Response
Under the Nuclear Waste Policy Act of 1982, the policy of this country is for DOE to dispose of spent nuclear fuel and high-level radioactive waste by geologic disposal. The commercial generators of spent nuclear fuel (that is, utilities) are responsible for paying the costs of disposal through a fee of 1 mil (one-tenth of 1 cent) for every kilowatt-hour of electricity generated at commercial nuclear plants. Equivalent amounts are paid by the Federal Government to cover similar costs associated with disposal of spent nuclear fuel or high-level radioactive waste generated or owned by the United States. The utility fees go into the Nuclear Waste Fund, which is administered by the Secretary of the Treasury. The Secretary of Energy makes expenditures from the Nuclear Waste Fund subject to appropriations by Congress. Congress also appropriates the funds from taxpayer revenues to cover the cost of disposing of spent nuclear fuel and high-level nuclear waste generated or owned by the United States.
The NWPA specifies the roles of several organizations to carry out the ultimate disposal of spent nuclear fuel and high-level radioactive waste. DOE must characterize the Yucca Mountain site and determine whether it is appropriate to recommend that it be approved for repository development. The Environmental Protection Agency establishes the regulatory standard for a repository at Yucca Mountain and the Nuclear Regulatory Commission must apply this standard as part of its licensing process for a repository. DOE is not aware of any ongoing activities or funding associated with the Alameda Corridor.

5.4 (9337)
Comment - EIS001888 / 0053
EIS Statement (pg. 2-67) 2.2.3 - The estimated cost of both Scenarios 1 and 2 for the first 100 years ranges from $51.5 billion to $56.7 billion, depending on whether the dry storage canisters have to be replaced every 100 years. The estimated cost for the remaining 9,900 years of Scenario 1 ranges from $480 million to $529 million per year. There are no costs for Scenario 2 after the first 100 years because the scenario assumes no effective institutional control.

Clark County Comment - Because of the faulty scenarios put forth in the DEIS, the cost data in section 2.2.3 has no basis. DOE should provide a No Action set of scenarios that at least are protective of the public health and safety. The scenarios should also incorporate both institutional and passive controls at the current storage sites that are comparable to what DOE intends to use at the proposed repository. NEPA Regulation: Sec. 1502.14 Alternatives including the proposed action; Sec. 1502.16 Environmental consequences.

Response
Through passage of the NWPA, Congress not only established a requirement that DOE prepare an EIS but modified certain requirements for complying with the National Environmental Policy Act. The NWPA does not require the EIS to consider the need for a geologic repository, the time at which a repository could become available, and alternatives to isolating spent nuclear fuel and high-level radioactive waste in a repository. In addition, the EIS does not have to consider any site other than Yucca Mountain for development as a repository. For these reasons, this EIS does not analyze alternatives other than the Proposed Action and No-Action Alternative.

Congress based its decision to pursue geologic disposal, in part, on the *Final Environmental Impact Statement, Management of Commercially Generated Radioactive Waste* (DIRS 104832-DOE 1980). In that EIS DOE evaluated alternatives to geologic disposal including very deep borehole disposal, disposal in a mined cavity that resulted from rock melting, island-based geologic disposal, subseabed disposal, ice sheet disposal, well injection disposal, transmutation, space disposal, and no-action. In its 1981 Record of Decision on that EIS, DOE decided to pursue the mined geologic disposal alternative for the disposition of spent nuclear fuel and high-level radioactive waste (46 *FR* 26677; May 14, 1981).

DOE analyzed the No-Action Alternative, or maintenance of the status quo, to serve as a baseline for comparing the magnitude of environmental impacts of the Proposed Action. Under the No-Action Alternative, and consistent with the NWPA, as amended, DOE would terminate activities at Yucca Mountain and undertake site reclamation to mitigate any significant adverse environmental impacts. Spent nuclear fuel and high-level radioactive waste would continue to be stored onsite at commercial reactors and DOE sites. In addition, DOE would prepare a report to Congress with its recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislative authority. Under any future course that would include continued storage, commercial and DOE sites would have an obligation to continue managing spent nuclear fuel and high-level radioactive waste in a manner that protected public health and safety and the environment. However, the future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain did not receive a recommendation as a repository is uncertain.

In light of these uncertainties, DOE decided to illustrate one set of possibilities by focusing the analysis of the No-Action Alternative on the potential impacts of two scenarios—long-term storage of spent nuclear fuel and high-level radioactive waste at the current sites with effective institutional control for at least 10,000 years, and long-term storage with no effective institutional control after about 100 years. Although neither of these scenarios is likely, DOE selected them for analysis because they provide a baseline for comparison to the impacts of the Proposed Action and because they reflect a range of the impacts that could occur. No-Action Scenario 1 (continued institutional controls) shows that spent nuclear fuel and high-level radioactive waste can continue to be stored with proper monitoring and maintenance and be protective of the public health and safety. Scenario 2 (no effective institutional controls after 100 years) makes the same assumptions regarding institutional control that are made for the Proposed Action. The National Environmental Policy Act regulations cited in the Comment do not indicate a need to redefine the No-Action Alternative just because the impacts associated with No-Action may be undesirable.

5.4 (9991)
Comment - EIS001888 / 0496
[Clark County summary of comments it has received from the public.]

The EIS should provide estimates of the total life-cycle cost under each alternative (including No-Action and if Yucca Mountain becomes unacceptable). Cost should be a factor in the decision making process. The EIS should analyze cost impacts on a nationwide scope, not just the cost impacts at Yucca Mountain. Costs should be provided for all studies associated with site characterization; construction, operation, and closure of the repository; transportation; and post-closure. Costs associated with both routine and accident scenarios should be discussed. For accident scenarios the EIS should discuss financial responsibilities- An accident occurs at a utility, who pays for the clean up? During transportation, who pays? During operation of the repository, who pays? During postclosure, who pays? The EIS should include an analysis of costs associated with health impacts (sterilating miscarriage [sic], cancer, etc.), losses of tourism and business (including farming commodities value), loss of property value, loss of environmental opportunities because funding that has to be spent on the repository program will not be available to fund other environmental projects, and lack of distributed capital available to local economies. The analysis also should discuss factors that might influence the accuracy of cost estimates.

Response
Section 2.1.5 of the EIS presents cost estimates for a Yucca Mountain Repository (including costs for transportation, repository development, construction, operation and monitoring, and closure). Section 2.2.3 presents cost estimates for the No-Action Alternative. DOE based these estimates on the best available data and standard cost estimating techniques. The preparation of detailed cost estimates as suggested by this Comment, would require a level of information that is currently not available.

DOE developed these estimates for comparative purposes and to aid decisionmakers in discriminating between the No-Action Alternative and the Proposed Action discussed in the EIS. The estimates do not include costs before early 2002, when DOE anticipates a decision on repository development, or the costs for siting and characterization of Yucca Mountain. The No-Action estimate includes only costs that differ from those of the Proposed Action estimate. For example, it does not include storage costs until 2010 when a repository (if approved) would first accept spent nuclear fuel and high-level radioactive waste because storage would be necessary until then under both the Proposed Action and the No-Action Alternative. The No-Action estimate is based on, and consistent with, industry experience for dry storage of spent nuclear fuel and high-level radioactive waste.

As discussed in Section 4.1.8 of the EIS on potential accidents in the repository operations area, and in Section 6.2.4 on potential transportation accidents, the probability of release of significant quantities of radioactive materials would be very low. Furthermore, cost estimates of evacuation and cleanup in the unlikely event of an accident would be highly uncertain and require speculation to develop. Therefore, cleanup costs are not considered in the cost estimates. Other potential health risks from the Proposed Action would also be very low, as discussed in Chapter 4 on repository construction, operation and monitoring, and closure; in Chapter 5 on postclosure repository performance; and in Chapter 6 on transportation risk. In the unlikely event of an accident, the Price-Anderson Act establishes a system of financial protection for persons who might be injured by a nuclear accident or incident (see Section M.8).

Assessing impacts from perceived risks such as losses of tourism and other business or loss of property value does not depend on the actual physical effects or risks of a Proposed Action, but the negative perception of those effects or risks by the public. The extent of the impacts from such perceptions is extremely speculative, and the National Environmental Policy Act requires analysis of potential impacts that are reasonably foreseeable, not speculative.

However, DOE has assessed the state of research into perception-based impacts and stigma effects, including the independent reviews conducted by the Nuclear Waste Technical Review Board and others, and identified and assessed relevant published studies since the publication of the Draft EIS (see Appendix N of the Final EIS). DOE recognizes that while in some instances risk perceptions could result in adverse impacts to portions of a local economy, there are no methods whereby such impacts can be predicted with a reasonable degree of certainty. While stigmatization and resulting adverse impacts can be envisioned under some scenarios, it is not inevitable or measurable, and any such stigmatization would likely be an aftereffect of unpredictable future events, such as a

serious accident. Consequently, DOE addressed but did not attempt to quantify potential impacts from risk perceptions or stigma in the EIS.

Cost accuracy and variations can occur due to differences in the design features selected for repository design, operational assumptions, and time-value-of-money components. DOE based the updated repository cost estimate in Section 2.1.5 of the EIS on the latest information available, including an updated design concept that includes features such as drip shields, a more robust waste package, and blending of commercial spent nuclear fuel to create a more uniform heat output from waste packages. To provide the public with updated information on the design concept for the proposed repository, DOE issued a Supplement to the Draft EIS in May 2001. In a companion document (DIRS 153849-DOE 2001), DOE provided additional technical information, including updated design information, to support consideration of a Site Recommendation.

5.4 (10240)
Comment - EIS001888 / 0589
We have reviewed the Environmental Impact Draft Study (EIDS), and have found many areas have been completely over looked.

There were no studies or surveys done in the following areas:

Cost Effectiveness

Existing Storage - versus - the cost of encasement, trucking, roadway repair, etc.

Response
Sections 2.1.5 and 2.2.3 of the EIS discuss the repository and No-Action cost estimates, respectively. The repository cost estimate includes the costs of loading the spent nuclear fuel for shipment and shipping (including all required fees). These two estimates are for comparative purposes and as such provide one measure of cost effectiveness.

5.4 (10251)
Comment - EIS002115 / 0012
The cost of clean-up at the Nevada Test Site and cost to build new routes, rail or roads, cost to ensure precautions are being taken, cost to train emergency response staff and costs to clean up radioactive accidents would probably far exceed finding alternative ways to reuse this radioactive waste. The EIS has an inadequate analysis of the cost. It should include analysis of the eventuality of the waste at Yucca Mountain and funds to monitor it, costs of drip shields, backfill, lease and repair.

Response
With the passage of the NWPA, Congress defined this Nation's policy for the disposal of spent nuclear fuel and high-level radioactive waste to be geologic disposal. Section 113 of the Act states that the EIS need not consider the need for a repository or alternatives to geologic disposal. Therefore, this EIS analyzes neither the environmental impacts nor costs of alternative ways to reuse spent nuclear fuel or high-level radioactive waste. Estimated costs of the Proposed Action presented in Section 2.1.5 of the EIS include the costs for transportation, repository development, construction, operation and monitoring, and repository closure. As discussed in Section 4.1.8 regarding potential accidents at the repository operations area and in Section 6.2.4 regarding potential transportation accidents, the probability of release of significant quantities of radioactive materials is very low. However, DOE has presented the potential costs associated with cleanup of transportation accidents that could occur (see Section J.1.4.2.5). The cost of the other actions mentioned in the comment is included in Section 2.1.5.

5.4 (10401)
Comment - EIS002192 / 0007
Now the one thing we did get at the end of our TRB [Nuclear Waste Technical Review Board] meeting, and this was on the cost of the drip shields, and the first time it ever came out, and that was they wanted 5,000 to a hundred drip shields.

These are the things that are going over the canisters, and Judy and David were there so they can corroborate this, and they would not order them until 2060 and the cost would be three billion dollars in today's moneys.

Now that's not only unacceptable, but you heard the date 2060, and I want the public to know that, because whether they're considering whether this will be lengthened because of all the suits and so on, including my own for fraud and color of office, I don't know.

Response
Drip shields are one of the current design features discussed as a partial barrier to divert infiltrating water away from waste packages in an emplacement drift (see Section 2.1.2.2.4). DOE has updated the environmental impact and cost estimates to reflect the incorporation of drip shields in the reference design. Because the purpose of drip shields would be to prevent dripping water from contacting the waste packages and dripping water could not occur until closure of a repository at Yucca Mountain, there would be no need to purchase and install them until immediately before repository closure. If repository closure occurred 50 years after the projected initial emplacement of waste in 2010, drip shields would be installed in approximately the beginning of 2060. If closure took place later, the procurement and installation of drip shields would also take place later.

5.4 (10426)
Comment - EIS001927 / 0033
There are some other very important questions that the DEIS needs to answer. How is it that the State of Nevada estimates the Yucca Mountain Project costing $54 billion, while DOE projects $28 billion?

Response
DOE has updated the cost estimate in the Final EIS based on refinements to the design of the facility and now estimates costs to range from $42.8 billion to $57.4 billion in 2001 dollars (see Section 2.1.5 of the EIS). The cost estimate includes only the projected costs from 2002 forward. That is when a decision regarding development of Yucca Mountain as a repository site is currently anticipated. DOE has clarified the discussion to describe the forward-looking basis of the estimate. The costs up to 2002 have been added for completeness as well. DOE is confident that the best available information was used for making its cost estimate. The basis for the DOE cost estimate is included in Section 2.1.5 and the associated reference document.

5.4 (10580)
Comment - EIS002131 / 0004
September 1, New York City Times article: "'The Energy Department has spent 23 billion dollars during the last five years to clean up nuclear waste, but little cleanup resulted, partly because of resistance to new technology,' a government audit said today." So by law, by the Nuclear Waste Policy [Act], the government or the DOE cannot even look at alternatives like this. This was released in 1979 after Three Mile Island happened, and in 1982, they installed a new energy -- nuclear waste policy making burial, so that buries are. For twenty years, it's been here waiting to be used, and nuclear waste can be eliminated and generate power from it. Something's rotten in Denmark, folks.

Response
Since passage of the Nuclear Waste Policy Act of 1982, utilities and their ratepayers have paid approximately $9.8 billion into the Nuclear Waste Fund to pay for development of a repository for spent nuclear fuel and high-level radioactive waste. By the end of Fiscal Year 1999 (September 30, 1999), the program had spent approximately $6 billion. DOE has used these expenditures exclusively for the purposes specified in the Nuclear Waste Policy Act as amended (NWPA); they are not available for other research such as development of new waste technologies.

However, Congress recognized that new technologies for waste management could be developed in the future and that spent nuclear fuel contains potentially valuable resources. Section 122 of the NWPA requires DOE to maintain the ability to retrieve the materials emplaced in the repository in the event that a decision was made to retrieve them to protect public health and safety or the environment or to recover constituent parts of spent nuclear fuel. This retrievability requirement is also reflected in the Nuclear Regulatory Commission's disposal regulations [10 CFR 63.111(e)]. In accordance with these requirements, the operational plan for the Yucca Mountain Repository provides for a design and management approach that would isolate wastes from the public in the future while allowing flexibility to preserve options for modifying emplacement and retrieving the waste. This design would maintain the ability to retrieve emplaced materials for at least 100 years and possibly as long as 300 years in the event of a decision to retrieve the waste either to protect the public health and safety or the environment, or to recover resources from spent nuclear fuel (see discussion in Section 4.2 of the EIS).

In addition, at the direction of Congress, DOE is studying transmutation of radioactive waste. The transmutation process involves state-of-the-art principles, some of which are not yet proven. However, even if transmutation becomes a feasible technology, a repository is still an essential element of the nuclear fuel cycle because significant quantities of highly radioactive, long-lived materials would remain (see additional discussion in Section 9.1.3 of the EIS). In addition, and although not within the scope of this EIS, DOE's Office of Energy Efficiency and Renewable Energy has active and ongoing programs regarding energy efficiency policy. Areas of focus include industrial technologies, transportation technologies, power technologies, and Federal energy management. Budgets for the four fiscal years from 1998 to 2002 for energy efficiency and renewable energy activities have averaged about $1 billion per year. More information regarding DOE efforts in energy efficiency and renewable energy can be found on the Internet at http://www.eren.doe.gov.

5.4 (10668)
Comment - EIS001966 / 0008
The "No Action Alternative" does not address fully the costs of nuclear waste storage, which is not included in decommissioning costs. Monitoring costs and cask maintenance and replacement costs would be significantly higher than those stated, based upon dry cask storage experience.

Response
DOE based the No-Action cost estimates on the best available information related to the current cost of storage at many commercial and DOE nuclear facilities.

5.4 (10813)
Comment - EIS000280 / 0007
Based on the Department's own analysis, moving spent nuclear fuel to a central location where it can be more effectively managed and monitored results in cost saving ranging from 25 billion to 4.8 trillion dollars.

Response
Thank you for your comment.

5.4 (10891)
Comment - EIS000451 / 0003
It could be concluded that the cost of inaction and maintaining the status quo is unacceptable. DOE estimates costs at Yucca Mountain, which includes construction, transportation and monitoring of the site for 100 years, 28.8 billion dollars.

In contrast, DOE's cost estimates for leaving spent fuel where it is now in temporary storage facility at 72 commercial sites and five DOE sites nearly doubled to between 15.5 and 36.7 billion dollars over 100 years. But these estimates are only the tip of the iceberg. They do not include costs incurred by the utilities to build and maintain temporary storage facilities now, tentatively scheduled to start in 2010. Taxpayers will bear these costs one way or another.

For example, should any of the utilities be forced to decommission their power plants before DOE takes the spent fuel, they will have to replace that power. The courts could slap the department with damages for these kinds of costs. The utilities estimate that such costs for temporary storage could reach 8 billion dollars. That's above and beyond the 16 billion dollars already collected for the Nuclear Waste Trust Fund.

Response
DOE presents updated cost estimates in Sections 2.1.5 of the Final EIS for the Proposed Action (from $42.8 billion to $57.4 billion in 2001 dollars) and Section 2.2.3 for the No-Action Alternative ($55.7 billion to $61.3 billion for the first 100 years, and $519 million to $572 million per year for the remaining 10,000-year analysis period).

As stated in Chapter 7, the future course that Congress, DOE, and the commercial utilities would take if there was no development of a repository at Yucca Mountain is uncertain. Speculation on the consequential costs of that uncertain course is beyond the scope of this EIS.

5.4 (10896)
Comment - EIS000447 / 0004
There's a cost savings to the nation, somewhere between 25 million and 4.8 trillion dollars as a result of moving the fuel from around the 72 facilities to one facility.

Response
Thank you for your comment.

5.4 (10937)
Comment - EIS000479 / 0004
It is significantly more cost efficient to dispose of materials at one site. The draft EIS estimates the cost at 28.8 billion dollars for construction, transportation, emplacement, operation, and 100 years of monitoring. It would cost 51.5 to 56.7 billion dollars to dispose of HLW [high-level radioactive waste] on-site in dry storage canisters at reactors across the country for the first 100 years. Costs rise to $480 million to $529 million per year for the remaining 9,900 years of storage under Scenario 1.

- South Carolina utilities, at a cost passed on to consumers, have already contributed 1.05 billion dollars into the Nuclear Waste Fund.

- The extra cost to utilities and consumers under no-action Scenarios 1 and 2 are simply unacceptable, especially given the increased risk of environmental damage that will likely occur after the first 100 years of storage.

Response
Thank you for your comment. Sections 2.1.5 and 2.2.3 of the EIS present updated cost estimates for the flexible design (from $42.8 billion to $57.4 billion in 2001 dollars) and the No-Action Alternative ($55.7 billion to $61.3 billion for the first 100 years and $519 million to $572 million per year for the remaining 10,000-year analysis period).

5.4 (11098)
Comment - EIS002135 / 0004
Spending lots of money on a hole in the ground creates political pressure to open the repository. They say that they're studying Yucca Mountain by digging a hole, but because they're doing that, they are creating that political pressure to fill that hole with the nuclear waste that's currently generated. This nuclear waste approach is out of sight, out of mind, and that is not going to work.

Response
DOE is following the mandate of the NWPA to characterize the Yucca Mountain site and make a recommendation to the President regarding the suitability of Yucca Mountain as the location for a spent nuclear fuel and high-level radioactive waste repository. The results of the Department's characterization studies and the results of the environmental impact analysis in this EIS will form the basis for the Department's recommendation to the President.

5.4 (11118)
Comment - EIS001207 / 0007
It seems rather obvious that "recycling" has economic advantage to the agency program-wide budget, as well as commercial nuclear utility interests. What parties are responsible for the disposal costs of MOX [mixed-oxide] spent fuel projected to be generated from recycling of 37 metric tons of surplus weapons Grade plutonium? Is the cost of disposition to be paid by the utility companies using the MOX fuel, the U.S. taxpayer (as part of indirectly to electricity consumers supplied by nuclear utilities? It is worth mention that consumers presently purchasing electricity from nuclear generating plants pay more for their electricity than consumers supplied by other fuels. One-time plutonium recycling via MOX fuel requires some means to pay disposal costs of spent fuel, how is the cost to be assessed and what parties are to pay for it?

The logic, as expressed, in DOE ROD [Record of Decision] of 1/4/00 requires explanation. Contention that security measures and safeguards with goal of keeping 50 metric tons of weapons surplus plutonium with considerable (hundreds of millions of dollars in monetary value) are best served by transferring it to private industries for processing and accounting requires considerably more consideration and details!

Response
As alluded to in the comment, converting weapons-usable plutonium to fuel for commercial nuclear reactors serves the purpose of using a valuable energy resource to produce electricity as well as serving the nonproliferation purpose of putting the plutonium in a non-weapons-usable form. The contract that DOE has with a private firm specifies that the utility that has irradiated the fuel it owns and is responsible for the costs for its disposal. The spent mixed-oxide fuel would be disposed of like any other commercial spent nuclear fuel under the provisions of the NWPA. A fee is assessed to utilities, currently set at 1 mil (one-tenth of a cent), for each kilowatt-hour of electricity generated from the fuel.

Conversion of the plutonium oxide rendered from surplus weapons to mixed-oxide fuel would be done pursuant to a contract between DOE and a private firm. The conversion facility would be located at the Savannah River Site and licensed and regulated by the Nuclear Regulatory Commission. Safety and security of the mixed-oxide fuel used by utilities would be ensured in the same manner as other nuclear fuel pursuant to individual nuclear plant licenses from the Nuclear Regulatory Commission. The monetary value of the surplus weapons-usable plutonium would be realized by utilization of the material to produce electricity while at the same time putting it in a form that is not suitable for weapons use.

5.4 (11297)
Comment - EIS001814 / 0026
DEIS Page 2-58: The costs would total about $29 billion. This is representative and would vary somewhat, depending on the thermal load, packaging, and transportation scenarios and on the Nevada transportation alternative selected.

The estimated cost of the proposed action given in the EIS is not consistent with cost estimates prepared for DOE. The estimated cost for rail construction could be significantly higher than the $800 million shown in Table 2-5. For example, DOE contractor cost estimates for rail options are as high as $1.055 billion ("Nevada Potential Repository Transportation Strategy, Study 2", Volume 1, TRW, February 1996). These costs do not include the cost of rolling stock. In addition, the "costs associated with or supporting DOE program level activities, including national and Nevada transportation (emphasis added) program integration, etc." are not included (Environmental Impact Statement Cost Summary Report, TRW, June 1999, p. 6).

Response
The 1996 study cited in the comment (DIRS 101214-CRWMS M&O 1996) is not the most up-to-date source of information on cost estimates for rail options to the proposed Yucca Mountain Repository. The source for the most up-to-date data is *Nevada Transportation Study Construction Cost Estimate* (DIRS 154822-CRWMS M&O 1998) and is consistent with the $800 million stated in the EIS Proposed Action cost estimate. For the Final EIS, DOE adjusted the costs to 2001 dollars. The material quoted from the *Environmental Impact Statement Cost Summary Report* (DIRS 104980-CRWMS M&O 1999) is in error. The Proposed Action cost estimate in Section 2.1.5 of the EIS includes national transportation costs under "Waste acceptance, storage, and transportation," Nevada transportation costs under "Nevada transportation," and program integration costs under "Program integration."

Thank you for pointing out the error in the reference. DOE has corrected the reference citation in the Final EIS.

5.4 (11406)
Comment - EIS002251 / 0004
I see no economic analysis for the costs to citizens of the no-action versus having the Yucca Mountain dump.

Response
Section 2.1.5 of the EIS discusses the estimated costs of the Proposed Action and Section 2.2.3 discusses the estimated costs of the No-Action Alternative. DOE based these estimates on the best available data and standard cost estimating techniques. The estimated cost information does not serve as justification for a repository, but provides a point of comparison between the Proposed Action and the No-Action Alternative. Commercial utilities are responsible for the costs of disposal of commercial spent nuclear fuel and the Federal Government is responsible for the costs of disposing of waste generated or owned by the United States. The utility fees are currently specified to be 1 mil (one-tenth of one cent) for each kilowatt-hour of electricity generated by a commercial nuclear power reactor. The utility fees go into the Nuclear Waste Fund, which is administered by the Secretary of the Treasury.

Congress also appropriates the funds from taxpayer revenues to cover the cost of disposing of spent nuclear fuel and high-level radioactive waste generated or owned by the Federal Government. The most recent estimates show that approximately 70 percent of repository-related costs would be paid from the Nuclear Waste Fund and about 30 percent from taxpayer revenues. Thus, the commercial utilities are "paying their fair share" of repository program costs along with taxpayers. However, the cost estimates in the EIS do not consider and are not sensitive to the source of funding.

5.4 (12342)
Comment - 010170 / 0016
The Proposed Yucca Mountain Repository is a very poor use of taxpayer funds - for the money already spent, irradiated fuel rods could already be contained. According to the "Total System Life-Cycle Cost of the Civilian Radioactive Waste Management Program" DOE document, suitable containers for onsite storage can be fabricated for $100,000 per metric ton of irradiated fuel. When calculated for the 77,000 tons of irradiated fuel estimated for disposal in the next 30 years, the cost would be 7.7 billion dollars. Assuming that mass production would reduce the cost farther, the $6.7 billion already spent on Yucca Mountain could have provided safe containers on site already.

Response
The NWPA directs the Secretary of Energy to perform site characterization activities at the Yucca Mountain Site and, if the site is found suitable make, a recommendation to the President on whether to approve the site for development of a repository. As stipulated by the NWPA, while the Federal Government has the responsibility to provide for the permanent disposal of spent nuclear fuel and high-level radioactive waste, the costs of such disposal should be the responsibility of the generators and owners. The Nuclear Waste Fund was established to pay for the actions specified in the NWPA, such as site characterization, repository design, site recommendation, and licensing. DOE does not have the discretion to use the funds for other purposes such as the purchase of waste storage containers for onsite use.

5.4 (12691)
Comment - EIS001887 / 0121
Page 2-58; Section 2.1.5 - Estimated Costs Associated with the Proposed Action

The cost of the repository program should include the whole program, including a breakdown for each thermal load, each packaging scenario, and all transportation scenarios. Given the broad uncertainty in the design of the repository in the Draft EIS, the cost estimate for the monitored geologic repository lacks any substantive basis. The same is true for waste acceptance, storage, and transportation.

The costs estimates associated with the Proposed Action contained in the Draft EIS are grossly understated. The State of Nevada commissioned an independent study of program costs in1998 (see Attachment T, "An Independent Cost Assessment of the Nation's High-Level Nuclear Waste Program"). The study found that DOE's proposed program, as it was then conceptualized, would cost $53.9 billion (in 1996 dollars). The study also found that, at most, the Nuclear Waste Fund could be expected to generate $28.1 billion (in 1996 dollars), leaving a taxpayer liability of at least $25.8 billion. The study did not take into account many of the costly "design features and alternatives" DOE now considers essential for the Yucca Mountain facility. It also did not analyze the effect of probable early power plant closures that could significantly reduce the amount of funds generated by the fee imposed on nuclear-generated electricity, the primary source of the Nuclear Waste Fund.

The Draft EIS fails to assess the impact of the projected revenue shortfall on DOE's ability to implement the Proposed Action. By understating the real costs of the project and failing to reconcile costs with available revenues, DOE obscures a major issue that goes to the heart of the viability of the entire project.

Response
The cost estimate for the Proposed Action (see Section 2.1.5 of the Draft EIS) assumed the high thermal load scenario used in the Draft EIS. The transportation information is independent of the thermal load and is the highest estimated cost, factoring in mode and route options. The reference in the Draft EIS for the estimated costs was the *Environmental Impact Statement Cost Summary Report* (DIRS 104980-CRWMS M&O 1999). The report contains the cost estimates for the various thermal loads and inventory modules described in the Draft EIS. For instance, the report's overall cost estimate under the low thermal load scenario was about 13 percent higher than the estimate in

the Draft EIS (DIRS 104980-CRWMS M&O 1999). The cost estimate for the Final EIS (Section 2.1.5) reflects the current flexible design.

DOE developed these estimates for comparative purposes and to aid decisionmakers in discriminating between the Proposed Action and the No-Action Alternative. The estimates do not include costs before early 2002, when DOE anticipates a decision on repository development, or the costs for siting and characterization of Yucca Mountain. The No-Action estimate (Section 2.2.3 of the EIS) includes only costs that differ from those of the Proposed Action estimate. For example, it does not include storage costs until 2010, when a repository would first accept spent nuclear fuel and high-level radioactive waste, because storage would be necessary until then under both the Proposed Action and the No-Action Alternative. The No-Action estimate is based on, and consistent with, industry experience for dry storage of spent nuclear fuel and high-level radioactive waste.

The State of Nevada report noted in the comment, *An Independent Cost Assessment of the Nation's High-Level Nuclear Waste Program* (Attachment to this comment document), contains the higher cost estimate of $53.9 billion associated with total system life-cycle costs (historic as well as future costs) of a Yucca Mountain Repository. The latest DOE total system life-cycle cost estimate as presented in the Final EIS for a repository flexible design provides an estimate of total system costs from $42.8 billion to $57.4 billion (see Section 2.1.5 of the Final EIS).

Section 302 of the Nuclear Waste Policy Act of 1982 specifies that funding for disposal of commercial spent nuclear fuel would be provided by payment of fees to the Secretary of Energy by the generators of electricity from nuclear powerplants. Equivalent amounts paid by the Federal Government would cover similar costs associated with disposal of spent nuclear fuel or high-level radioactive waste generated or owned by the United States. Utility fees and Federal appropriations are required to be sufficient to offset expenditures associated with repository studies, transportation, and operation and closure of a repository as determined by an annual review by the Secretary of Energy. The utility fees are currently specified to be 1 mil (one-tenth of 1 cent) for each kilowatt-hour of electricity generated by a commercial nuclear power reactor. The utility fees and Federally funded share are subject to change based on a required annual review of adequacy. The utility fees go into the Nuclear Waste Fund, which is administered by the Secretary of the Treasury. Excess funds for any given year, as determined by the Secretary of Energy, are invested in obligations of the United States and earn interest. The Secretary of Energy makes expenditures from the Nuclear Waste Fund subject to appropriations by Congress. Congress also appropriates the funds from taxpayer revenues to cover the cost of disposing of high-level nuclear waste and spent nuclear fuel generated or owned by the United States. The most recent estimates show that approximately 70 percent of repository-related costs would be paid from the Nuclear Waste Fund and 30 percent from taxpayer revenues.

As reported in the *Report on Assessment of Fee Adequacy Based on FY 1999 Total System Life Cycle Cost Update*, the Nuclear Waste Fund investments had a market value of $8.5 billion as of September 30, 1999 (DIRS 152076-CRWMS M&O 1999). The analysis in the report found that the current 1-mil-per-kilowatt-hour fee charged to generators of commercial spent nuclear fuel was adequate to cover projected disposal expenses and recommended that the fee remain unchanged.

The question of funding adequacy and analysis of projected revenue shortfalls are beyond the scope of this EIS. Congress passed the Nuclear Waste Policy Act of 1982 directing DOE to perform site characterization activities, prepare a potential site recommendation, and then license, construct, operate and monitor, and eventually close a repository if the site was approved. DOE believes that Congress, having directed the Federal Government to embark on this project, would continue to fund it adequately to protect the public health, safety, and welfare. Analysis of adequate funding levels would necessarily be based on expected funding levels over time and would be extremely speculative. DOE believes sufficient information regarding the potential impacts and costs associated with the Proposed Action and No-Action Alternative is included in the EIS to support current decisionmaking.

5.4 (12701)
Comment - EIS001380 / 0002
Regarding costs: I note that one international option being considered is to establish a commercial nuclear waste storage deposit in the Australian outback, a project that might generate as much as $5 billion in revenue. It certainly seems fair that the nuclear power industry should be charged a hefty fee for the storage of their nuclear waste if the Yucca Mountain Action is enacted.

Sections 2.1.5 on page 2-58 and 2.2.3 on page 2-67 of Volume 1 deal with projected costs of the action and no-action options:

Section 2.1.5 is one short paragraph to justify a staggering $28.8 billion cost! The section gives no rationale supporting the validity of the data except a study by TRW [TRW Environmental Safety Systems Inc.], a biased DOE contractor. DOE should at least assure the public the cost figures have some validity and reliability through cross-referencing other cost estimates and sources of this type of data. Instead, there is no analysis of the costs - shouldn't data from several sources have been considered and analyzed in the report itself? The brevity of this critical section is ludicrous and invites incredulity that this data represents reality. This section is unacceptable as it stands and needs to be dramatically expanded. The paragraph needs to address who pays for Yucca Mountain in clear English, if it is the taxpayer, say so. The draft EIS should state explicitly how much of the Yucca Mountain bill and transportation costs taxpayers, industry and federal agencies will pay.

Section 2.2.3 dealing with the costs of the no-action alternative is one paragraph 10.5 lines long and indicates the cost of the no-action alternative is 2-30 times higher but, again, no rationale or cost justification is given. In short sections 2.1.5 and 2.2.3 are worthless and should be completely revised and presented in a more responsible format where the cost-sharing formula is presented.

Response

Section 2.1.5 of the Final EIS presents updated cost estimates for the proposed Yucca Mountain Repository (including costs for transportation, repository development, construction, operation and monitoring, and closure). It also includes costs of waste acceptance, storage, and national transportation; Nevada transportation; program integration (quality assurance, human resources and administration, Nuclear Regulatory Commission fees, and Nuclear Waste Technical Review Board funding); and program institutional costs (payments-equal-to-taxes, benefits payments to the State of Nevada, transportation training assistance, and other financial assistance payments). Section 2.2.3 presents cost estimates for the No-Action Alternative. DOE based these estimates on the best available data and standard cost estimating techniques.

The estimated cost information does not serve as justification for a repository, but provides a point of comparison between the Proposed Action and the No-Action Alternative. The reference cited in the Comment provides the basis for the Proposed Action cost estimate for the period from 2002 to closure.

The NWPA specifies geologic disposal for spent nuclear fuel and high-level radioactive waste. Section 302 of the Act specifies that funding for disposal of commercial spent nuclear fuel is provided by payment of fees to the Secretary of Energy by the generators of electricity from nuclear powerplants. Equivalent amounts are paid by the Federal Government to cover similar costs associated with disposal of spent nuclear fuel or high-level radioactive waste generated or owned by the United States. The utility fees are currently specified to be 1 mil (one tenth of 1 cent) for each kilowatt-hour of electricity generated by a commercial nuclear power reactor. The utility fees go into the Nuclear Waste Fund, which is administered by the Secretary of the Treasury. Congress also appropriates the funds from taxpayer revenues to cover the cost of disposing of spent nuclear fuel and high-level radioactive waste generated or owned by the United States. The most recent estimates show that approximately 70 percent of repository-related costs would be paid from the Nuclear Waste Fund and about 30 percent from taxpayer revenues. Thus, the private commercial utilities are "paying their fair share" of repository program costs along with taxpayers. However, the cost estimates in the EIS do not consider and are not sensitive to the source of funding. The estimates do not include costs before early 2002, when DOE anticipates a decision on repository development, or the costs for siting and characterization of Yucca Mountain. The No-Action estimate includes only costs that differ from those of the Proposed Action estimate. For example, it does not include storage costs until 2010 when a repository would first accept spent nuclear fuel and high-level radioactive waste because storage would be necessary until then under both the Proposed Action and the No-Action Alternative. The No-Action estimate is based on and consistent with industry experience for dry storage of spent nuclear fuel and high-level radioactive waste.

DOE has updated the cost estimates in the EIS, including clarification that the cost estimates are comparative in nature and include costs from 2002 through repository closure. For the Proposed Action, the EIS now includes costs up to 2002 for informational purposes. DOE believes that it is appropriate to provide the details of the cost estimates in reference documents; therefore the cost discussions in the EIS are brief.

5.4 (13281)
Comment - 010231 / 0014
Page 22 of the Executive Summary of the Yucca Mountain Science and Engineering Report.

Under Performance Confirmation and Monitoring is stated, "Performance confirmation and monitoring activities would continue throughout the preclosure period, which could extend up to 300 years." Does DOE have confidence in such a long performance-monitoring period particularly in light of the statement on page 2-31 of the Supplement about "uncertain funding" for even the relatively shorter term construction of the disposal system and transporting of the waste?

Response
As reported in *Nuclear Waste Fund Fee Adequacy: An Assessment* (DIRS 153257-DOE 2001), the nuclear waste fund investments had a market value of $8.5 billion as of September 30, 1999. The analysis in the report found that the current fee of 1 mil (one tenth of 1 cent) per kilowatt hour charged to generators of commercial spent nuclear fuel was adequate to cover projected disposal expenses (including costs associated with packaging and transportation) and recommended that the fee remain unchanged.

Section 302 of the Nuclear Waste Policy Act of 1982 specifies that funding for disposal of commercial spent nuclear fuel is provided by payment of fees to the Secretary of Energy by the generators of electricity from nuclear power plants. Equivalent amounts are paid by the Federal Government to cover similar costs associated with disposal of spent nuclear fuel or high-level radioactive waste generated or owned by the United States. Utility fees and Federal appropriations are required to be sufficient to offset expenditures associated with repository studies; transportation; and operations and closure of a repository, as determined by an annual review by the Secretary of Energy. In the event that future generations decide that the potential repository should remain open for an extended period (up to 300 years or more), the fee structure could require modification. The statement, about "uncertain funding," was intended to be in the context of funding requirements for those activities (in the relative near-term leading up to the ability to receive and emplace waste (if the site was recommended and approved), and was not intended to reflect doubt about funding once the facility, if approved, became operational.

5.4 (13350)
Comment - 010296 / 0010
Also, increased size of the footprint and additional protection requirements could mean diversion of resources and funds to certain aspects of the project such as additional excavation and drip shield requirements. The funds could be used in other aspects of the project to improve performance and/or safety. Such improvement could be along the transportation routes, or development of a better ventilation system.

Response
In 1987, Congress amended the Nuclear Waste Policy Act of 1982, directing the Secretary of Energy to perform site characterization activities at the Yucca Mountain Site and, if the site is found suitable make a recommendation to the President on whether to approve the site for development of a repository. As stipulated by the Nuclear Waste Policy Act of 1982, while the Federal Government has the responsibility to provide for the permanent disposal of spent nuclear fuel and high-level radioactive waste, the costs of such disposal should be the responsibility of the generators and owners. The Nuclear Waste Fund was established to pay for the actions specified in the Nuclear Waste Policy Act of 1982, such as site characterization, repository design, site recommendation, and licensing. All funds spent by DOE on site characterization and repository design, including the elements of the flexible design, including drip shields and repository ventilation systems, are for the purpose of ensuring that the repository could perform safely and within regulatory guidelines.

5.5 Alternatives Suggested by Commenters

5.5 (29)
Comment - 147 comments summarized
Commenters asked that DOE study more options to a repository at Yucca Mountain and conduct more research into alternative disposal methods. The focus of these comments ranged from statements that the Department needs a new approach so it is not "in a rush" to open a Yucca Mountain Repository, to statements that the Nation needs a

"huge research program" with the "level of commitment, intelligence and ingenuity that was required by the Manhattan Project." Commenters who expressed their belief that DOE is in a rush to approve a Yucca Mountain Repository stated that DOE should take the time to "think this thing through very carefully." Several commenters stated that the Nation would be better off spending the money designated (or already spent) for work on the Yucca Mountain site to fund new research on better ways to dispose of spent nuclear fuel and high-level radioactive waste or programs to promote research on relevant new technologies.

Commenters faulted DOE for its focus on Yucca Mountain and its current research program for spent nuclear fuel through such comments as the following: DOE is "pushing the Yucca Mountain plan"; slow down and take a better, longer look at alternatives; it is time to remove nuclear waste issues from the political arena and allow scientists to create new solutions; and a quick fix is unsuitable to such a big problem. Commenters also criticized geologic disposal as akin to "going back to the early 1900s" when the country used outhouses to put human waste underground.

Commenters pointed out that technology has advanced enormously over the last 100 years, so it is reasonable to assume that advances, including ways to neutralize nuclear wastes, will continue to emerge during the next 100 years. Some commenters referred to specific technologies that they feel would allow continued onsite storage and waste management, including accelerated transmutation of radioactive waste, the "Roy Process" (a transformation process), further reprocessing techniques, and "radiation eating fungus" for high-level radioactive waste. Other Commenters mentioned waiting for development of outer space disposal technology and subseabed disposal.

Two commenters stated that Senator Domenici of New Mexico has proposed a bill that would create an office of spent nuclear fuel research within DOE to focus research efforts on spent nuclear fuel processing and disposal technologies. Commenters emphasizing the development of new technologies expressed their expectation that future technology will enable processing of spent nuclear fuel into harmless materials, reusable components, or waste with reduced radioactivity or volume. On this subject, many commenters mentioned accelerator transmutation of waste as a technology that should have a high level of research priority, believing that transmutation has the potential to greatly reduce the period of time that wastes remain a danger to the environment and the public. Commenters expressed the belief that technological advances would provide an alternative to geologic disposal. Several comments encouraged DOE to "hold off for 50 years" to see what new technologies develop through the funding of new research programs or from the inevitable evolution of science.

Response

In the late 1970s, DOE evaluated numerous alternatives to geologic disposal of spent nuclear fuel and high-level radioactive waste and published its findings in October 1980 as part of the *Final Environmental Impact Statement on Management of Commercially Generated Radioactive Waste* (DIRS 104832-DOE 1980). Among the specific technologies evaluated were deep hole disposal, rock melt disposal, island-based disposal, subseabed disposal, well-injection disposal, and disposal in outer space. DOE considered the benefits, impacts, and costs of these alternatives and concluded in its 1981 Record of Decision (46 *FR* 26677; May 14, 1981) that the mined geologic disposal alternative should be pursued (see Section 1.3.1 of the EIS).

While the NWPA does not provide for alternatives to geologic disposal, Congress has separately directed DOE to study accelerator transmutation of radioactive waste and to prepare a plan for developing that technology. Congress appropriated $4 million to develop the accelerator transmutation plan, which includes a science-based research program, a description of an operational accelerator transmutation system, and other information specifically requested by Congress. DOE submitted the report, *A Roadmap for Developing Accelerator Transmutation of Waste (ATW) Technology* (DIRS 110625-DOE 1999), to Congress on November 1, 1999. (DOE has modified Section 9.1.3 of the EIS to include the results of this report.)

In the accelerator transmutation process, long-lived radionuclides could be difficult both to isolate and to transmute. Moreover, even if accelerator transmutation becomes a practical technology, a repository would still be an essential element of the nuclear fuel cycle because significant quantities of highly radioactive, long-lived materials would remain.

In the past, DOE has reprocessed spent nuclear fuel to reclaim various useful materials. Reprocessing produces several waste streams, however, which require their own waste- or resource-management technologies, including disposal of high-level radioactive wastes in a repository. DOE has halted routine spent nuclear fuel reprocessing.

DOE agrees that new technologies for waste management could be developed in the future, but at this point, DOE does not recommend abandonment of current waste management strategies.

The operational plan for the proposed repository provides for a design and management approach that isolates wastes from the public in the future while allowing flexibility to preserve options for modifying emplacement or retrieving the waste. The repository would remain accessible for scientists to continue testing and monitoring. By taking a modular or sequential approach to design and construction, more flexibility would be provided for the future generation of scientists and engineers to continue evaluating repository performance while maintaining the capability to retrieve spent nuclear fuel and high-level waste emplaced in the repository.

5.5 (30)
Comment - 47 comments summarized
Commenters stated that DOE should use a location other than Yucca Mountain for the disposal of spent nuclear fuel and high-level radioactive waste. Some commenters favored the repository concept but asked DOE to build it in their states to bring jobs to their communities. Overall, however, most commenters suggesting the use of an alternative location criticized the Proposed Action. Several commenters asked for a repository to be located in another state, preferably in the Eastern United States near the majority of nuclear powerplants. Other commenters suggested it would be safer to build multiple repositories in various regions or in each state that has a nuclear powerplant, thus reducing transportation distances.

Other commenters suggested that the Department use existing DOE sites, including the Nevada Test Site, for both DOE high-level radioactive waste and commercial spent nuclear fuel. Several commenters suggested that DOE should rely on the private sector through the licensing of private independent spent nuclear fuel storage facilities. In addition, commenters suggested that alternatives to a Yucca Mountain Repository site could be found by using tribal facilities, deep ocean disposal, an island in the Pacific Ocean, or a different repository built in a granite formation or salt dome.

Response
With the passage of the NWPA, Congress established and defined this Nation's policy for the disposal of spent nuclear fuel and high-level radioactive waste to be geologic disposal. Under the provisions of the NWPA, Congress also directed DOE to prepare this EIS as information for the possible recommendation to the President to approve the development of the Yucca Mountain site for a geologic repository. Congress' intent was to implement a permanent Federal solution to the Nation's problem of accumulated spent nuclear fuel and high-level radioactive waste to avoid passing the problem unaddressed to future generations. As discussed in Section 1.5 of the EIS, the NWPA states that the EIS need not consider alternatives to geologic disposal or any site other than Yucca Mountain for repository development.

In the late 1970s, DOE evaluated numerous alternatives to geologic disposal of spent nuclear fuel and high-level radioactive waste and published its findings in October 1980 as part of the *Final Environmental Impact Statement on Management of Commercially Generated Radioactive Waste* (DIRS 104832-DOE 1980). Among the specific technologies evaluated were very deep hole disposal, rock melt disposal, island-based disposal, subseabed disposal, well injection disposal, and disposal in outer space. Only deep geologic disposal demonstrated an acceptable combination of benefits and risks.

Under the Nuclear Waste Policy Act of 1982, DOE evaluated several sites in different geologic media for disposal of spent nuclear fuel and high-level radioactive waste. Pursuant to that Act, DOE identified nine candidate sites. The Secretary of Energy nominated five of the nine sites for further consideration and study. In May 1986, DOE issued environmental assessments for each of the five sites. Based on DOE's recommendations, President Reagan approved three of the five sites as candidate sites for a repository. The three sites were Deaf Smith County, Texas; Hanford, Washington; and Yucca Mountain, Nevada. In 1987, Congress amended the Nuclear Waste Policy Act to designate one of the three candidate sites, Yucca Mountain, as the only site to be studied as a potential location for a repository.

5.5 (183)
Comment - 90 comments summarized
A number of commenters believe that the best alternative is to terminate production of nuclear waste and eliminate nuclear power. The majority of these commenters called simply for the utilities to stop producing nuclear waste, which in the context of the Comments means commercial spent nuclear fuel. Commenters stated that production must stop because the Nation needs a safe means of disposal, which is not a repository; nuclear waste production must end and the nuclear industry should have solved the waste problem before it began production. If the Yucca Mountain Repository became a reality, the problem of nuclear waste production would continue because the utilities would continue to produce waste.

Response
DOE and the commercial nuclear industry have long been aware of the issues associated with the disposal of spent nuclear fuel and high-level radioactive waste. There has been a concerted effort to determine the most appropriate means of disposal. The Yucca Mountain site characterization studies and this EIS are a continuation of these efforts.

At present, commercial nuclear powerplants produce approximately 20 percent of the total electric power generated nationwide. The role nuclear powerplants will play in the future of the Nation depends, in part, on the relicensing by the Nuclear Regulatory Commission and future power generation decisions made by each commercial utility, pursuant to Commission regulations. Even if the Nation's utilities ceased the production of commercial spent nuclear fuel, the waste generated in the past would still require long-term disposition, as directed by the NWPA. If nuclear powerplants continue to operate, they will continue to produce spent nuclear fuel. If the repository became operational and met its volume limitation, the issues of where and how to manage additional spent nuclear fuel would require decisions on the national level.

5.5 (1517)
Comment - EIS000442 / 0003
Alternative scenarios for implementing the NWPA, including the mitigation provisions of Section 116 are not included. No -- only no -- the full range of the alternatives to implement repository construction, operation transportation closure should include scenario one, no mitigation measurements. Scenario 2, financial mitigation measurements only and Scenario 3, physical -- No. 4 would be the mix of financial and physical mitigation measures.

Response
Chapter 9 of the EIS provides DOE's initial list of mitigation considerations identified at this time and describes management actions that DOE would consider to reduce or minimize adverse impacts to the environment. Chapter 9 also states that, apart from the requirements of the National Environmental Policy Act, Section 116 of the NWPA requires the Secretary of Energy to provide financial and technical assistance to mitigate impacts of the development of a repository and the characterization of the site. The Section 116 mitigation assistance review process and the EIS process are distinct from one another and the implementation of one does not depend on the implementation of the other.

DOE believes that the presentation of mitigation actions in the EIS is consistent with the requirements of both the NWPA and the National Environmental Policy Act. DOE would furnish assistance under Section 116(c) of the NWPA as a result of procedures separate from the site evaluation process that includes this EIS. The Section 116(c) procedures establish specific steps outside the National Environmental Policy Act for grants, requests, and agreements on compensation, and payments in lieu of taxes. Nevertheless, DOE would evaluate requests for assistance submitted by the potentially affected units of local government.

5.5 (3050)
Comment - EIS001048 / 0005
What the nuclear power companies should do instead of pressuring the DOE to rid their states of nuclear waste, after they have made the monetary profits, is to spend a small percentage of those profits in research to discover economical ways to neutralize the waste and then dump it in their own states. The nuclear power companies provide power to residents. At what cost???? They make the money, they should fund the intense research needed to make the discovery.

Focus your energy, dollars and efforts on research into ways to neutralize the waste.

Response
Through the NWPA, Congress has affirmed that the Federal Government is responsible for the permanent disposal of spent nuclear fuel and high-level radioactive waste. To accomplish this objective, Congress directed the Secretary of Energy to determine whether to recommend to the President that the Yucca Mountain site be approved for development of a repository for the permanent disposal of these materials.

Although DOE continues to focus on the development of a geologic repository as required by Congress, DOE also continues to fund research and development of other technologies that could prove useful in the management of spent nuclear fuel and high-level radioactive waste. One such technology is accelerator transmutation of waste. This technology could eventually result in the elimination or reduction of certain radionuclides in the inventory and thus could add flexibility to the design of a repository and reduce uncertainties about performance. Section 9.1.3 of the EIS provides additional details.

5.5 (3173)
Comment - EIS001194 / 0004
Rather than store spent nuclear fuel in a Nevada salt cavern, it might prove less hazardous and more cost effective to load the stuff atop an old 'Saturn 5' booster and blast it into the sun. We would still have that pesky transportation problem, however. Perhaps it would be best therefore, to simply bury nuclear waste on site. A public outcry against such practice could easily be prevented by buying up all housing within a reasonable proximity to the facility, then selling it off to the families of power plant owners, their lobbyists, politicians eager to support their programs, and all the so called "experts" who keep trying to sell us on the addle headed notion that, in their hands, atomic waste is safer than baby powder. This solution may also prove more cost effective than shipping the waste cross-country to a hollowed-out mountain. While quite sure that your office would dismiss this suggestion out-of-hand, I am just as certain your position there would be wholly untenable.

Response
In the Record of Decision (46 *FR* 26677; May 14, 1981) for the *Final Environmental Impact Statement, Management of Commercially Generated Radioactive Waste* (DIRS 104832-DOE 1980), DOE determined that a monitored geologic repository was the best available method for the disposal of spent nuclear fuel. Under the provisions of the NWPA, Congress directed DOE to prepare an EIS to evaluate the Yucca Mountain site for its use as a geologic repository and, as such, a permanent solution to the national problem of the disposal of spent nuclear fuel and high-level radioactive waste. The Act states that this EIS need not evaluate alternatives to geologic disposal at Yucca Mountain. As a consequence, the EIS does not include alternatives such as deep space disposal, onsite storage or burial, or other approaches.

5.6 Other Comments on Alternatives

5.6 (1934)
Comment - EIS000478 / 0002
In addition to creating a permanent repository for nuclear materials at Yucca Mountain, the federal government should continue to generously fund research into alternative methods of dealing with radioactive waste. The storage facilities at Yucca Mountain are currently projected to hold only the amount of waste that the U.S. will produce by 2015. If alternative methods for dealing with this waste are not found by then, more permanent deep geologic repositories will need to be constructed. It is very much in the interest of the American people and the federal government to do everything necessary to see that such an alternative or alternatives are found.

Response
In passing the Nuclear Waste Policy Act of 1982, Congress affirmed that the Federal Government is responsible for the permanent disposal of spent nuclear fuel and high-level radioactive waste. To accomplish this goal, Congress envisioned the possibility of more than one repository—prohibiting the Nuclear Regulatory Commission from approving a license for the emplacement of more than 70,000 metric tons of heavy metal (MTHM) in the first repository until such time that a second repository is in operation [Section 114(d)]. The total projected inventory of spent nuclear fuel and high-level radioactive waste is more than 70,000 MTHM. Emplacement in excess of

70,000 MTHM at Yucca Mountain would require legislative action by Congress unless a second repository was in operation.

It is reasonably foreseeable for Congress to take such a legislative action, or that the first repository at Yucca Mountain would be approved for disposal of greater than 70,000 MTHM, once a second repository was in operation. Chapter 8 of this EIS analyzes cumulative impacts from the disposal at Yucca Mountain of all spent nuclear fuel and high-level radioactive waste projected to be produced through 2046 for which DOE will retain ultimate responsibility. Chapter 8 also considers the disposal of Greater-Than-Class-C waste and Special Performance Assessment Required waste at Yucca Mountain.

In the NWPA [Section 114(f)(2)], Congress directed that DOE need not consider alternatives to geologic disposal in preparing this EIS (see Section 2.3.1 of the EIS). The future course that Congress, DOE, and the commercial utilities would take if Yucca Mountain did not receive a recommendation as a repository site is highly uncertain. Chapter 9 discusses the development of new technologies (such as accelerator transmutation of waste) as one possibility. DOE does have an ongoing investigation of accelerator transmutation of waste as a potential technology for reducing the volume of waste ultimately requiring geologic disposal.

As discussed in Chapter 9 of the EIS, DOE continues to evaluate new technologies (such as accelerator transmutation of waste) to reduce the potential effects of the repository project. However, the Department cannot expend any funds not authorized and appropriated by Congress. The broader effort advocated by the Commenter would require appropriation of funds by Congress; except on a limited basis, funds for investigation of alternative methods of management of spent nuclear fuel and high-level waste have not been appropriated.

5.6 (2420)
Comment - EIS000511 / 0005
In conclusion, I guess a lot of comments -- not tonight, but more so earlier -- really dealt with this as if it was a referendum on nuclear power, which it is not. High-level waste exists and must be dealt with in a safe and conscientious manner. We have to do this and deal with the waste that's out there. Stopping the repository does nothing to deal with the waste.

I don't think the DOE is any way is rushing into this. Earlier today there was a lot of people concerned about rushing into this. If I remember right, we started the program in Congress in 1982. The earliest, now the Department of Energy thinks it could accept fuel at Yucca Mountain, is 2013. I don't think that meets anybody's definition of a rush project. In fact, it's one of the longest running federal projects in the history of the United States. I don't think there's any basis to say this is rushing. I think they have proceeded in a definitely very cautious and deliberate manner.

Response
DOE acknowledges this point of view and appreciates the commenter's participation in the National Environmental Policy Act process.

5.6 (12712)
Comment - EIS002133 / 0008
There's been talk about this radioactive recycling. I just want to put that out. This is another thing that - that these folks are trying to do is slip one past us and recycle metals into the marketplace. All right. We're talking you go to the store, you get a new set of dishes and some new silverware and some spoons and stuff and it's radioactive, but you'll never know, because as soon as it leaves that power plant, as soon as it leaves the nuclear industry, it - the regulation of it stops. And so we have - we have the right to stop that from happening. We have the right to protect our future generations.

I mean, we're talking about nuclear waste that for the next 700 generations, 700 generations. Can you fathom 700 generations? I have a hard time thinking two generations ahead let alone 700 generations. This process, the DEIS process, I think you guys - I know you've worked really hard and I appreciate that you are doing the best you can, but, hey, you could start it over. You could all find new jobs. Talk to me. I'll see what I can do. I know a couple people here in Vegas. Maybe we could hook you up with some other kind of work, because there are other things you can be doing besides bringing this contamination here.

Response
Within the scope of this EIS, there is no contemplation of recycling spent nuclear fuel or high-level radioactive waste for uses of any kind in the marketplace.

REFERENCES

101214	CRWMS M&O 1996	CRWMS M&O 1996. *Nevada Potential Repository Preliminary Transportation Strategy Study 2.* B00000000-01717-4600-00050 REV 01. Two volumes. Las Vegas, Nevada: CRWMS M&O. ACC: MOL.19960724. 0199; MOL.19960724.0200.
154822	CRWMS M&O 1998	CRWMS M&O 1998. *Nevada Transportation Study Construction Cost Estimate.* FOIA Version. Las Vegas, Nevada: CRWMS M&O. ACC: MOL. 19981207.0258.
104980	CRWMS M&O 1999	CRWMS M&O 1999. *Environmental Impact Statement Cost Summary Report.* B00000000-01717-5700-00029 REV 01. Las Vegas, Nevada: CRWMS M&O. ACC: MOL.19991104.0619.
152076	CRWMS M&O 1999	CRWMS M&O 1999. *Report on Assessment of Fee Adequacy Based on FY 1999 TSLCC Update*. TDR-CRW-SE-000003 REV 01. Washington, D.C.: CRWMS M&O. ACC: MOV.19991221.0011.
104832	DOE 1980	DOE (U.S. Department of Energy) 1980. *Final Environmental Impact Statement Management of Commercially Generated Radioactive Waste*. DOE/EIS-0046F. Three volumes. Washington, D.C.: U.S. Department of Energy, Office of Nuclear Waste Management. ACC: HQZ.19870302.0183; HQZ.19870302.0184; HQZ.19870302.0185
101779	DOE 1998	DOE (U.S. Department of Energy) 1998. *Viability Assessment of a Repository at Yucca Mountain.* DOE/RW-0508. Overview and five volumes. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: MOL.19981007.0027; MOL.19981007.0028; MOL. 19981007.0029; MOL.19981007.0030; MOL.19981007.0031; MOL. 19981007.0032.
102031	DOE 1998	DOE (U.S. Department of Energy) 1998. *Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program.* DOE/RW-0510. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: HQO.19980901.0001.
110625	DOE 1999	DOE (U.S. Department of Energy) 1999. *A Roadmap for Developing Accelerator Transmutation of Waste (ATW) Technology*. DOE/RW-0519. Washington, D.C.: U.S. Department of Energy. TIC: 245890.
153257	DOE 2001	DOE (U.S. Department of Energy) 2001. *Nuclear Waste Fund Fee Adequacy: An Assessment.* DOE/RW-0534. Washington, D.C.: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: MOV.20010607.0015.

153849	DOE 2001	DOE (U.S. Department of Energy) 2001. *Yucca Mountain Science and Engineering Report.* DOE/RW-0539. [Washington, D.C.]: U.S. Department of Energy, Office of Civilian Radioactive Waste Management. ACC: MOL. 20010524.0272.
156900	DOE 2001	DOE (U.S. Department of Energy) 2001. *Life Cycle Cost Analysis for Repository Flexible Design Concepts*. TDR-CRW-SE-000017 REV 00. Washington, D.C.: Bechtel SAIC Co., LLC. ACC: MOL.20011120.0951.
100149	Interagency Review Group on Nuclear Waste Management 1979	Interagency Review Group on Nuclear Waste Management 1979. *Report to the President by the Interagency Review Group on Nuclear Waste Management.* TID-29442. Washington, D.C.: U.S. Department of Energy. ACC: MOL.19980625.0169.
100011	NAS 1957	National Academy of Sciences, Committee on Waste Disposal 1957. *The Disposal of Radioactive Waste on Land.* Publication 519. Washington, D.C.: National Academy of Sciences, National Research Council. TIC: 221455.